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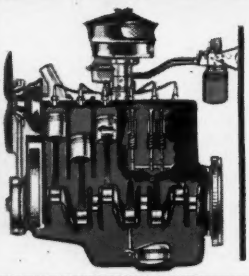

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Predict Your Own Future . . . . . *Lester David* 59

750,000 Platter Chasers . . . . . *Harry Kursh* 73

Which Sight For Your Rifle? . . . . . *Raymond R. Camp* 90

ANNOUNCING

MI's 2d Old Car Contest 68

McCAHILL ARTICLES

MI Tests The 1953 Kaiser Manhattan 82

Italy's Motor Masterpieces 86

REGULAR FEATURES

MMI: He Breeds Mink Coats . . . . . *H. W. Kellick* 64

Prize Gadget: Self-Sealing Tube Cap 72

New In Science 78

Pin-Up Car 80

New For The Road 81

New For The Sportsman 93

HHF: S. F. Briggs 94

New For The Home 95

SHORT FEATURES

Parades For Sale 70

Toys For Peace 76

DEPARTMENTS

Editor's Workbench 14

Invention Clinic 18

Dear Editor 26

(Continued on page 8)

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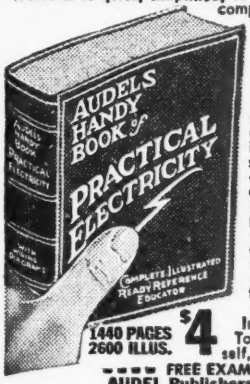

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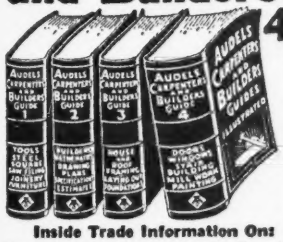

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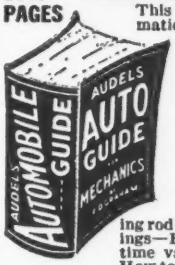

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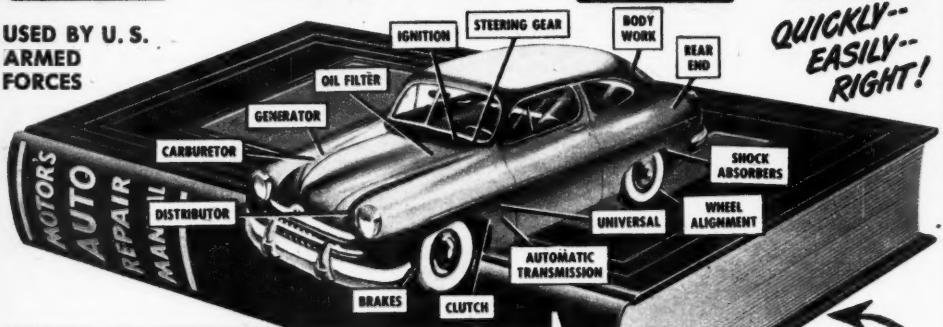

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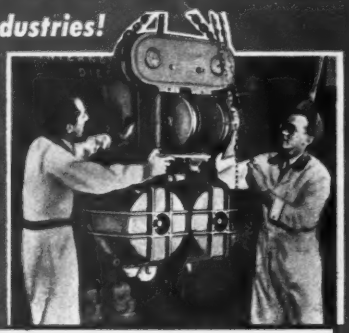

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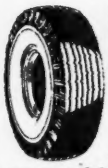

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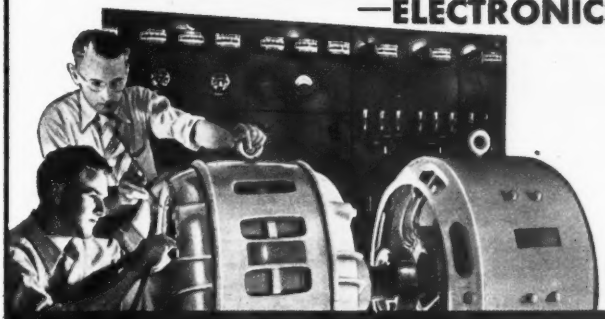

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continued from page 2

Your Home In Miniature 96

Walls And Siding 98

Insulate And Save 103

Fenestration 108

The Roof Over Your Head 113

Your Floors 118

Cement And How To Use It 122

The Plumbing System 126

Space Saving Partition 130

Shop Shorts 132

Car Care—Voltage Regulator 136

New For Your Car 139

Boating Kinks 140

The Modern Potter's Wheel 142

Monthly Photo Contest 145

Plywood Album 146

Keep It Warm! Keep It Cool! 148

Roundhouse—Power Panel 150

Pictures Through A Telescope 153

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750-16(6)	8.76	800-15	7.16	825-15	10.06	1000-20	19.76
550-16	5.96	820-15	7.36	600-20	10.66	1100-20	20.96
550-17	5.46	670-16	6.66	32x6(8)	11.56	1200-20	23.76
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The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

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The Editor's Workbench

MIscellaneous Meanderings

Don't look now but there's an item of rare interest to all you MI guys on pages 68-69 of this here issue. To whit, the first official announcement of the Second MI Old Automobile Contest, originated last March by us geniuses who mastermind (y)our favorite magazine. For the benefit of any students who came in late, this was the celebrated quizzer which gave everybody a fair and square chance to win a Nash Rambler station wagon, or a piece of the $500 in prize monies, just for having fun. Nobody had to send in a hunk of Joe Stalin's skull or the boiler off a 1918 Stanley Steamer or even a little old box-top, to get into the game. All you had to do was identify, correctly, the names of twelve old-time automobubbles—and we gave you a choice of three names (one of them the right one) under each picture. So even if you didn't know a Locomobile from a croquet mallet and just made twelve wild surmises, you could still take home a big prize. (Fellows that did a little research in old car books made out better, though, I must admit.)

Well, our first contest was such a smash hit, and so many of you birds clamored for another one real soon, that we decided to run Contest No. 2 in the upcoming December issue. Substantially, it will be the same as the original contest. And the top award will be a 1953 Dodge two-door sedan, a car we haven't even seen yet but which promises to be one of the sensations of the season. So get in there and pitch, pals, and the best of luck to one and all. . .

And speaking of luck, that old black magic interests everybody from crap-shooters to White House hopefuls. What's ahead for you? Gonna win that Dodge sedan? Gonna live 100 years? Gonna break your arm? I don't know if it will give you the answers but Les David's article Predict Your Own Future, which leads off this issue of MI, has some terrific stuff about palm-reading and crystal-ball gazing and such which I bet you never knew before. Ought to read it. . .

Ought to read our Bob Brightman's Crafts department real closely this month, too, because he's devoted just about the whole section to home repairs, modernization, building and etcetera. Some great, solid advice in there that will make your work easier and save you a lot of dough. . .

A gossoon the other day peered into my face and said, "Are you brown from the sun?" "Yes," said I. "Well," said he, "I'm Buck Rogers from the moon." Oh, well, what can you expect—things are tough all over. . .

And things, unfortunately, don't seem to be getting any less tough for our boys in Korea. The fighting is still savage and deadly and the end isn't in sight yet. One good thing, though, that has saved many lives and bucked up morale tremendously is the growing use of armored vests by our Marine and Army combat troops. We urged the widespread adoption of these really wonderful life-savers in the June issue in a piece by Frank Tinsley called Why Don't We Streamline the Infantry? It would be silly to pretend that our article was the deciding factor that influenced the Army just a few weeks later to order 25,000 of these bullet-resistant, shell-fragment-stopping vests for immediate shipment to Korea. But our article was widely reprinted in newspapers all over the country and the publicity from it and other sources undoubtedly had a lot to do with arousing the American public to demand that our boys get that extra protection in battle. Anyway, they're getting it now and we hope that some day every American fighting man will be issued one of these lightweight, immensely strong pieces of body armor that can and might save his life. . .

It's frustrating to sit back here, safe and civilian, and read the casualty lists and say to yourself, "What can I do to help?" Well, what can we do? We can and we should make frequent donations of blood because that precious fluid, which you and I can give so easily and so painlessly, is worth many times its weight in gold to a badly wounded man. We can send letters and packages to our boys overseas and we can let them know that we're backing them to the hilt in this war.

And there's another thing we can do, a very important thing. We can pick up our local telephone directory, turn to "Civil Defense Headquarters" and call the number listed. We can volunteer our services, by phone, to do one of the many vital jobs that must be done—and for which America needs 17,000,000 volunteers right now—against the day when the Korean War explodes into all-out attack against the continental United States itself. We hope that day never comes. But if it does, let's be ready.—*Bill Parker* •

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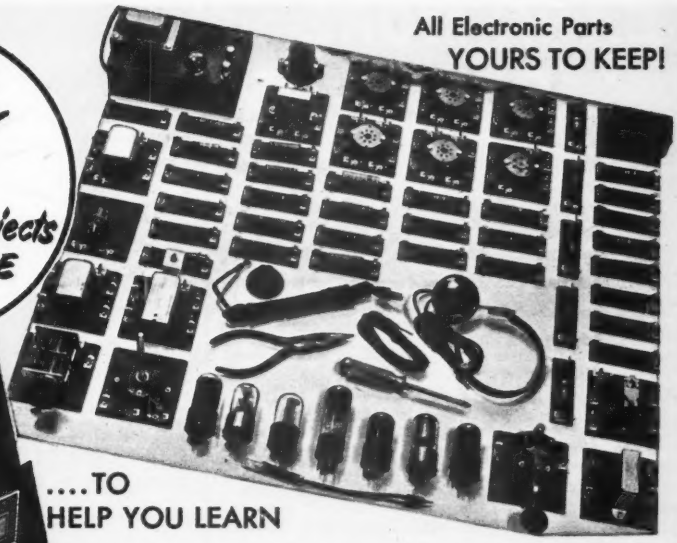

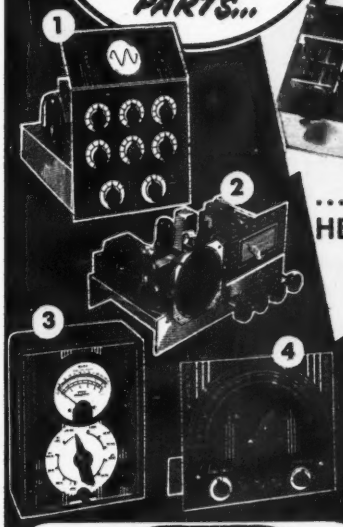

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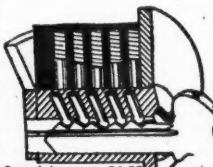

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False Teeth

THE vast files of dental patents seem to show that perfection in the making of plates, bridges, caps, crowns and dozens of other things is still a long way off. This, despite the fact that dentistry has made remarkable progress during recent years. What probably is more important is that mechanical dentistry is no longer a step-child. It is recognized as a field for highly skilled technicians, many being specialists in just one small detail of the finished product.

In some respects, modern dentures are worse today than in the day of the older vulcanite plates. This is not a statement picked out of thin air. Any dental laboratory will verify that more relining needs be done on modern plastic dentures than ever was done on the rubber forerunners. (Note: the word plastic is used here to designate dentures made from phenolic condensate resins, glycerol-phthalic acid, glyptal resins and the like, to differentiate from vulcanite or metal plates.)

Fitting Dentures

Let's see what happens in making and fitting, let us say, an upper plate or denture. Let's eliminate all the important details of when to do what, matching of teeth, correction of bite, control of involved psychological factors and other things with which the dentist must contend, stressing only those things to which the inventor might contribute.

The dentist reaches a point where he fills a metal tray with plaster of Paris or similar material and places it against the roof of the mouth. It is allowed to harden here, then is removed. Now it represents a mold from which a plate can be made.

Theoretically, the plate made from the casting should fit perfectly. But it doesn't. Why? Well, this is the reason given in a patent assigned to the S. S. White Dental Company by Walter S. Crowell. "Accompanying the loss of water of crystallization from the plaster is a far more serious phenomenon, being shrinkage and contraction of the mold. This shrinkage reduces the size of the mold and therefore of the denture made in it, in all directions. Cracking and unevenness may occur and by reason of the unnecessarily irregular shape of the plates, distortion often is present. The completed denture plate then fits the mouth very poorly, being tight and causing pain and discomfort. It is usually necessary to correct such shrinkage, distortions and disarrangement by an excessive amount of grinding."

The patent then goes on to describe a composition for forming molds which will not shrink when heated to temperatures of over 100 degrees C. Many other methods, specifying different compositions and materials have been patented before and since, each claiming correction against change in shape or disintegrating action during the production of the denture.

However, in modern technique, this is not a single-step procedure. From the plaster mold a "stone" is made. Stone, according to one patent is 1 to 5 per cent Rochelle salt with alpha gypsum. Then, a model is made in wax with all the teeth in place. This is checked in the patient's mouth to make sure that it will properly fill out the features. It may be filled in here and there or pushed out in various spots to correct drawn lines in the face and the like. After this, the denture is made by the laboratory, sometimes by the dentists. Then comes added grinding and correction. Areas must be cut away where ligaments or muscles in movement will not dislodge the plate.

Any mechanic will agree that there is something radically wrong with a piece of equipment which needs so much treatment after it was cast to conform to an accurate mold.

[*Continued on page* 28]

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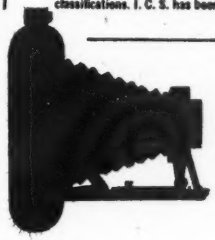

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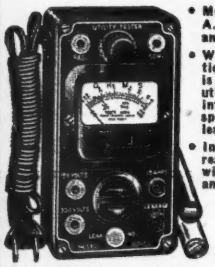

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GEORGIA
Specialty Distributing Co., Inc.
104 Pine Ave., Albany
425 Peachtree St., N. W., Atlanta
644 Reynolds St., Augusta
513 Arch St., Macon
223 E. Broughton St., Savannah
Prestwood Electronics Co., Augusta

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Allied Rad., 833 W. Jackson Blvd., Chi.
J. G. Bowman Co., 515 E. 75th St., Chi.
Newark Elec., 223 W. Madison St., Chi.
Hudson-Ross, 111 W. Jackson Blvd., Chi.
Montgomery-Ward & Co., Chicago, Ill.

IOWA
World Radio Laboratories, Inc., 740 W. Broadway, Council Bluffs

LOUISIANA
NEW ORLEANS
Radio Parts, Inc., 807 Howard Avenue
Columbia Rad. & Sup. Co., 3940 3rd St.
Southern Rad. Sup., 1900 Tulane Ave.

MAINE
Henry D. Burrage & Co., Portland
House-Sherman, 442 Main St., Rockland

MARYLAND
BALTIMORE
Kann-Ellert, 9 South Howard St.
Montgomery-Ward & Co.
Radio Electric Serv. Co., 3 N. Howard
Wholesale Rad. Parts, 311 W. Baltimore

MASSACHUSETTS
BOSTON
Boston Ship Serv., 230 State St.
Hatry & Young, 811 Boylston St.
Radio Shack Corp., 167 Washington St.
Radio Wire Television, 110 Federal St.
Radio Electronic Sales Co., 52 Chandler St., Worcester

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M. N. Duffy & Co., 2040 Grand River Ave. West, Detroit
Reno Radio, 1314 Broadway, Detroit

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Lew Bonn Co.
228 E. Superior St., Duluth
1211 LaSalle Ave., Minneapolis
141-147 W. 7th St., St. Paul
Montgomery Ward & Co., St. Paul

MISSOURI
Burstein-Applebee Co., 1012-1014 McGee St., Kansas City
Montgomery Ward & Co., Kansas City
Radiolab, 1612 Grand Ave., Kansas City
Walter Ashe Rad., 1125 Pine St., St. Louis

NEW HAMPSHIRE
Evans Radio, Concord

NEW JERSEY
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2839 Hudson Blvd., Jersey City
110 Market St., Newark
373 George St., New Brunswick
185 Main St., Paterson

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Montgomery Ward & Co., Albany
Adirondack Radio Supply, Amsterdam
Davega Stores, Inc.
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924 Flatbush Ave., Brooklyn
39-11 Main St., Flushing, L. I.
45 Main St., Hempstead, L. I.
163-24 Jamaica Ave., Jamaica
96-70 Queens Blvd., Rego Park, L. I.
175 Main St., White Plains, L. I.
27 Main St., Yonkers
Stallman of Ithaca, Box 306, Ithaca
Harrison Radio Corp., 172-31 Hillside Ave., Jamaica
Johnson Radio & Electronic Equip., 119 Hunt Road, Jamestown
Warren Rad., 31 Forrest Ave., Jamestown
Radio Equipment Corporation
147 Genesee St., Buffalo
5 Center St., Batavia
1363 Pierce Ave., Niagara Falls
W. E. Berndt, Syracuse
Electronic Lab. & Supply, West Utica

NEW YORK CITY
Davega Stores, Inc., 63 Cortlandt St.
Harrison Radio Corp., 10 W. Broadway
Maritime Radio Corp., 24 Whitehall St.
Nat Unger Inc., 169 Greenwich St.
Terminal Radio Corp., 85 Cortlandt St.

OHIO
Selectronic Sup., 1013 Jefferson, Toledo

OKLAHOMA
Radio Supply, Inc., Oklahoma City
Radio, Inc., 1000 S. Main, Tulsa

OREGON
United Radio Supply, Inc., Eugene
PORTLAND
Meier & Frank, Fifth & Alder
Montgomery Ward & Co.
Pacific Stationery, 414 S. W. 2nd Ave
United Radio Supply, Inc., 22 N. W. 9th

PENNSYLVANIA
Warren Radio, 12th & State St., Erie
George D. Barbey Co., Inc.
26 E. Vine St., Lancaster
821 Quentin Rd., Lebanon
111 N. Washington St., Pottstown
2nd & Penn St., Reading
Almo Radio Co.
412-16 N. 6th St., Phila.
509 Arch St., Phila.
6205 Market St., Phila.
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6339 Penn Ave., Pittsburgh
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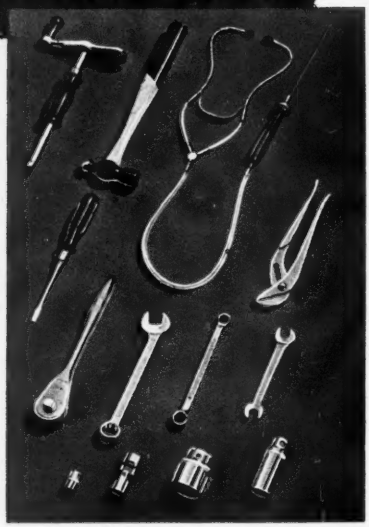

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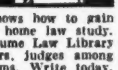

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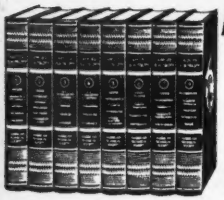

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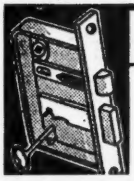

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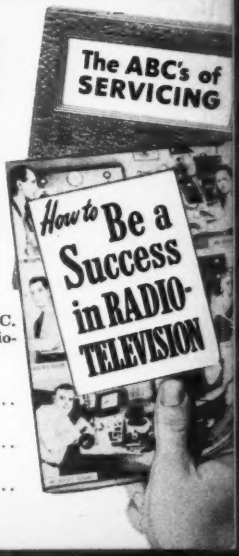

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Dear Editor—

Use this letters column as you see fit—make it a complaint box, question box, suggestion box or even a soap box. But use it! Our only requirement is that you sign your name and keep 'em short, interesting and clean. Address mail to: MECHANIX ILLUSTRATED, Letters Editor, 67 West 44th Street, New York 36, N. Y.

A Square Question

Could anyone help me with this one? I have three squares of which none seems to be square. Could you tell me how to tell for sure if a square is square?

Bill Holup
Antigo, Wisc.

Sure, just get yourself a carpenter's square. But make sure it's a square square. . . .

McCahill Pro and Con

Stop picking on Tom McCahill.
He's a good guy and I hope he keeps up the great work.

M. B. Dickinson
Oneco, Fla.

McCahill stinks. Bury him before he buries himself.

J. R. Rickie
Detroit, Mich.

Reader Dickinson meet Reader Rickie. Choose your weapons.

MI Monthly Mystery

A brakeman, fireman and engineer are employed on a train. Their names are Smith, Robinson and Jones—not respectively. On the train are three passengers with the same names, hereafter referred to as Mr. in order to distinguish them from the railroad employes.

1. Mr. Robinson lives in Detroit.
2. The brakeman lives halfway between Chicago and Detroit.
3. Mr. Jones earns exactly $2,000 a year.
4. Smith beat the fireman at billiards.
5. The brakeman's nearest neighbor who is one of the passengers earns three times as much as the brakeman.
6. The passenger living in Chicago has the same name as the brakeman.

QUESTION: What is the engineer's name?

Thomas Ferriott
Charlotte, N. C.

That Mystery Car Again

Readers Andrysont and Neal are probably both mistaken about the mysterious car without a driver in the front seat which they have seen on the roads (Dear Editor, June and Sept.).

What they have probably seen was a radio-controlled car designed by my father in 1950. He's now working on a new one with a range of 3,000 miles. It's very handy for transporting our dog who can't drive.

Stanley Spiegal
Asheville, N. C.

Any questions, anybody?

African Pigmy Railroads

Robert Whittier claims that Plymouth, Mass. is the home of the last two-foot gauge steam railroad in the world (Last of the Two-Footers, May 1952 page 96). Maybe it is in America.

Hasn't he ever heard of Africa? There are hundreds of two-foot tracks and equipment still in use commercially in the Congo, Kenya, Nyasaland, Southwest Africa and the Union of South Africa.

Gert. J. Osthuizen
Chakoskraal, Natal
South Africa

Oops! Wrong continent.

"Maybe we ought to go outside and talk this over."

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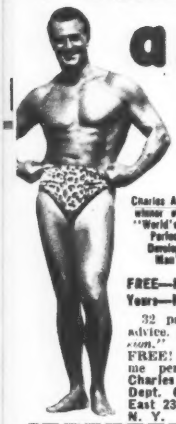

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Invention Clinic

[*Continued from page* 18]

Plastic vs Vulcanite

But that is not all. Plastic dentures do not hold their shape as well as the old vulcanite dentures. There is considerable variation resulting from biting stresses. Change in shape takes place as a result of internal physical or chemical changes within the plastic. No one seems to know exactly why.

Both dentists and dental laboratories have been striving to rectify the situation. The fact that it exists has been recognized by a Federal laboratory, a division of which has been doing research toward the development of a product, method or procedure to eliminate or minimize these changes. The new plastic materials have great values in color, ease with which they can be kept clean, light weight and other attributes. The older vulcanite materials had a tendency to take on particles of food which would ferment and produce what popularly is called denture breath.

Unless a thorough study of the dental art is made, the average inventor can offer little toward the complete picture. On the other hand, it is not essential for the inventor to

[*Continued on page* 32]

INVENTORS

Your first step—if you consider your invention to be something of importance—is to have a search made of pertinent, prior U. S. patents. If our search report indicates probable patentability of your invention, you may apply for a patent which gives you the right to exclude others from making, using or selling your invention as claimed for a term of 17 years.

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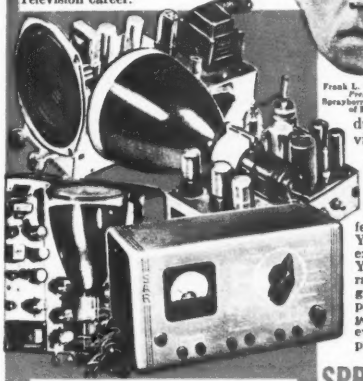

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Invention Clinic

[*Continued from page* 28]

consider the topic strictly from the standpoint of dentistry. Approach can be made toward the production of a mold which will accurately register the shape and size of some intricate pattern on which there is a cross-hatching of lines, then reproduce this in thin plastic to precision accuracy which will remain so after the plastic has been subjected to temperature changes, twisting and pressure variations.

The correct answer here might also play an important role in low temperature plastic bodies which will not crack under use. •

INVENTORS

Before you make any effort to market your invention, you should take the first steps toward proceeding for patent protection.

I shall be pleased to furnish you with information relative to patent procedure upon request from you, and this will be without any obligation on your part.

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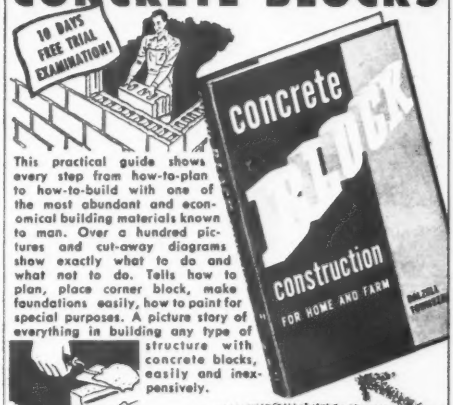

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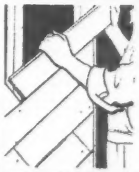

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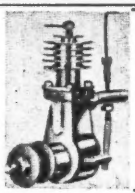

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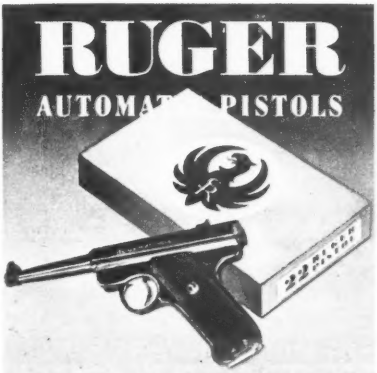

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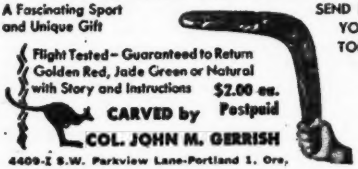

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525-18	6.89	800-15	7.29	825-18	23.79	1000-20	19.89
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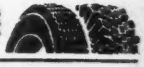

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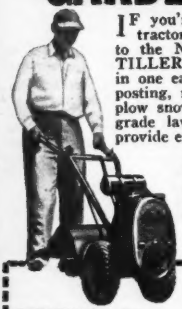

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HOME TV SERVICING —THIS EASY WAY

SHOOT TV TROUBLE FAST

with H. G. CISIN'S "TV DOCTOR"
Shows how to fix your own set rapidly and SAFELY!

YOURS TO TRY 5 DAYS FREE

Save money, throw away service contracts. Here's a real "fix-it-yourself" book written in language you can understand by a noted TV expert.

TUBES CAUSE 85% OF TV TROUBLES

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Reveals many closely guarded **TRADE SECRETS.** Lists over 123 trouble conditions. Method applies to **ALL TV SETS,** even newest RCA, Philco or any of 2000 models old or new. Copyrighted **TROUBLE SHOOTING GUIDE** pin-points hundreds of troubles.

ELEVEN (11) money-saving, fact-crammed, detailed, profusely illustrated chapters include: exactly how to locate tube or part causing trouble; practical ways to combat interference and ghosts; how to appraise and buy a better TV set for less money; how to install the best antenna for your location; also valuable information on wave traps, lead-ins, color TV, names & addresses of TV mfgs.—a veritable encyclopedia.

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SPECIAL OFFER: A new "TV Dictionary & PICTURE GUIDE" with illustrations, explaining TV Terms and selling for $1; H. G. Cisin's famous "TV TROUBLE SHOOTING METHOD" which trains you to be a TV DIAGNOSTICIAN & TV SERVICEMAN . . . sells for $1—PLUS "TV DOCTOR"—all 3 for only $2. postpaid. You save $1.

RUSH COUPON: Enclose $2. 5-days to read without risk or return for refund.

H. G. CISIN, Consulting Engineer
Department M-7
200 Clinton Street, Brooklyn 2, N. Y.

☐ Enclosed find $2 full payment for "TV DOCTOR," "TV TROUBLE SHOOTING METHOD" & "TV PICTURE GUIDE"—Rush all 3 TV Books postpaid.

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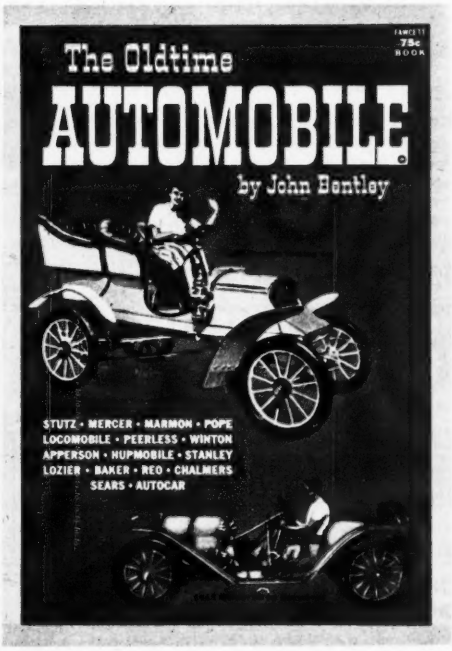

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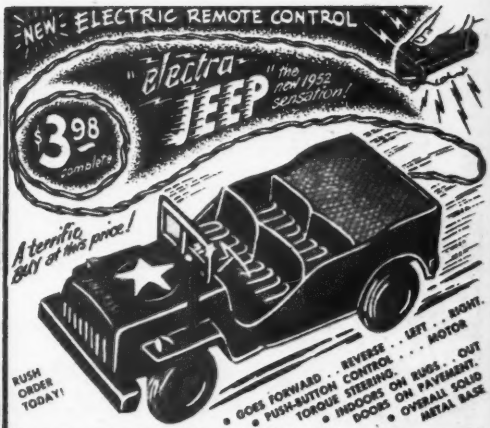
- HE'S OVER 19" TALL!
- MOVES HIS MOUTH, ARMS AND LEGS!

REAL COWBOY OUTFIT!

Hey kids—here's your chance to become a master ventriloquist—in a jiffy! Imagine—you can make *HAPPY the COWBOY* actually talk! (in your own voice, of course.) Pull the string in the back of his head—watch his lips move—hear your own words coming right out of *HAPPY'S* mouth! See how real he looks—rigged up in a cowboy hat, washable plaid shirt and western pants. . . Show off your skill at parties—at school! *SEND NO MONEY.* (C.O.D. you pay postage. Remit with order, we pay postage.)

NEW! ELECTRIC REMOTE CONTROL "electra JEEP" the new 1952 sensation!



Here is the sensationally new scale model ELECTRA JEEP that captivates every child! Push the button and off she goes—forward, to the left, to the right, or reverse. Runs outdoors on pavement or indoors on rug. Over ½ foot long with overall solid metal base and solid rubber wheels, and motor torque steering. Loads of fun for children and grownups alike! Rush your order today! SEND NO MONEY. (C.O.D. you pay postage. Remit with order, we pay postage.)

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- Windows Go Up and Down
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Fascinate the youngsters with hours of fun and action. Imagine—every car WORKS in the line of duty! 1 car with working windshield wiper, 2 cars with windows that open and close, 1 police car with gun that bangs and recoils, 1 ambulance with ringing and swaying bell, 2 taxis with meters that register fare, 1 fire chief car with bell that rings and sways. All 8 cars made of durable steel . . . rubber wheels cannot come out . . . bottoms completely enclosed . . . all new Two-tone and metallic finish . . . all differently colored. SEND NO MONEY. (C.O.D., you pay postage. Remit with order, we pay postage.)

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- ☐ ACTION FLEET 2.98
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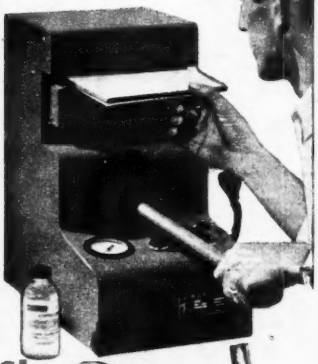
PLASTIC LAMINATING AT HOME!

Sensational New "ONE MAN BUSINESS" . . pays $10 to $20 profit for each dollar of cost.



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WARNER ELECTRIC CO.,
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Thousands of Beautiful Art Creations

No one yet has been able to list the thousands of gorgeous articles that can be made by Laminating as explained in our Free Information. Just a few are

COSTUME JEWELRY—CIGARETTE BOXES—JEWEL CASES—GLOVE AND HANDKERCHIEF BOXES—CUFF LINKS—NOVELTY BUTTONS—TRAY—CANDLESTICKS—COASTERS—CLOCK CASES—LAMP BASES PICTURE FRAMES—BOOK ENDS—PAPER KNIVES—KEY CHAIN CHARMS—CHECKERS—CHESSMEN—ADVERTISING SIGNS—NAME-PLATES—BOOKMARKS—BELT BUCKLES—TIE RACKS—KEEP-SAKES OF ALL KINDS.

$5-$10-and $20 BILLS COME TO YOU IN THE MAIL

By our MAGIC MAIL Plan you sit at home, send out mail, and get back money and orders. Additional profits in supplying local people with lifetime protection for

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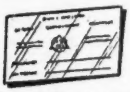

Lifetime protection. See how laminating protects against wear, soiling, and moisture damage with its smooth, flexible, plastic covering on each side. LIFE-TIME PROTECTION needed for valuable or sentimental objects of all kinds—even a priceless whisp of hair can be laminated. Think of the countless thousands of profit items for your Laminating Press.

WARNER ELECTRIC CO. Dept. L-12-T
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Rush complete information with illustrations showing the things I can make and the money possibilities in Plastic Laminating. All this is free. I do not pay a penny now or at any other time. No salesman is to call. Send all facts by prepaid mail. Be sure to tell me how I get orders and money from my Postman by your MAGIC MAIL Plan.

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Your advertisement can reach this mail-buying audience of multi-million readers for only 80c per word . . . payable in advance . . . minimum 10 words. Copy to be inserted in January issue must be in the office November 3. Mail to MECHANIX ILLUSTRATED, 67 West 44th Street, New York 36, N. Y. Word count: Zone number free. Figure one word: Name of state (New Jersey); name of city (New York); sets of characters as in key (14-D); also abbreviations as 35MM, 8x10, D.C., A.C.

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$10,800 PROFITS! YOUR Own Mailorder Business! No capital risk! "Success Plan" (worth $2) free! Write today! Treasury, 149 Storer, New Rochelle 12-X, N. Y.

ADVERTISE: 24 WORDS, 100 Canadian Newspapers, $5.50. Lists Free. Advertising Bureau, 10511-B Springfield, Chicago 43.

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BARGAINS—TERRIFIC Savings—Job Lots —Close-outs! Also save up to 50% on complete lines of Drygoods, Clothing, Hosiery, Notions, Drug Sundries, Toiletries, Novelties, Gifts, Jewelry, Television, etc. 2000 items. Send 25c for Illustrated Wholesale Bargain Catalog, Closeout Flyers, and Special "Get Acquainted" offer. Valuable merchandise certificate (worth many times 25c) included Free. Reliable Jobbers, 311-C North Desplaines, Chicago 6.

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$200 WEEKLY. NEW Invention. Amazing 4-second Presto Emergency tire chains, fit all modern auto wheels. National advertising building big demand. 3 sales daily to oil stations, dealers, etc., make $200 or more weekly. Territory going fast. Write Presto Chain Co., Dept. P-16, Des Moines 2, Iowa.

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VALUES GALORE—100 blades 45c. Gross needlebooks $4.80. Automatic cigarette lighters $7.20 dozen. Fullsize 25c Ballpens $8.40 gross. Bargain Catalog 5001 items free. Cutrate Wholesalers since 1916. Mills Sales Co., 26 West 23rd St., New York.

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BE A Money Maker . . . Represent magazines year around. Wonderful home work. Big Christmas profits now. Liberal commissions. Everything furnished. Write for Free Catalog. McGregor Magazine Agency, Dept. 520A, Mount Morris, Ill.

MAN TO earn $90 week up. Long needed invention. Advertised Saturday Evening Post, Country Gentlemen. Prospects everywhere. Full, part time. Exclusive. No investment. Free samples. Write Red Comet, Inc., Dept. 59-C, Littleton, Colo.

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TAKE LARGE Unit Orders For Wool Uniforms, Caps, Shirts, Ties, Wallets, Personal Initialed Buckles With Belts, Cap Badges, 3000 Emblems. Send For Free Outfit Now! Hook-Fast Co., Dept. MI, Roanoke, Va.

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GET INTO Million Dollar Work Clothes Business. Earn big money now, unlimited future! Sell finest-quality embroidered uniforms and work clothes to factories, garages, everybody! Huge profits possible. No experience needed. Gorgeous selling kit, actual fabric samples, including miracle Orlon! Everything Free! Write Topps, Dept. 4811, Rochester, Ind.

WRITE 3 WORDS—Collect $7.65 on 10-second demonstration to merchants—write on glass with Amazing Magic Crayon—Presto! 5 color advertising message takes fire—glows like brilliant neon. Three sales daily bring $22.95 profit. Rush postcard for details. Complete sales kit, free! Maxilume Co., 125 W. Hubbard, Dept. CL-10-T, Chicago 10, Ill.

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IS $210. A week worth a postcard to you? Then rush card with name and address for special Free Trial Plan that sells amazing new Automatic Refrigerator Defroster "like hot cakes!". Write to Mr. Lewis, D-Frost-O-Matic Corp., Dept. P-101, 173 W. Madison, Chicago 2, Ill.

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POSITIVELY MAKE $50.00 a day and up selling brand new item going to every type of Food and Beverage Store, Factories, Laboratories, Hospitals, etc. Samples Furnished. Utility Durawear, 53 West Jackson Blvd., Dept. MI-11, Chicago 4, Ill.

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$5 AN HR. & more possible in your home. You Can Paint It With Suede—Fabulous new business—spare or full time. Spray on rainbow colors—Auto dashboards and trunks—Signs—Radios—Toys—Figurines—Lamps — etc. — beautified with amazing new 3rd dimensional plush-like finish with touch-appeal as well as eye-appeal. I'll send you complete, step-by-step plans and equipment, including high-velocity spray gun for no-risk examination in your own home. Send no money—just name and address. Coast, 1004-CN S. Los Angeles St., Los Angeles 15.

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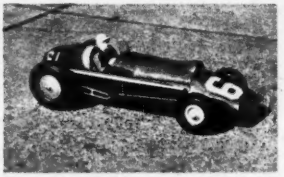
MAKE WISHING wells, game of skill, start route, cafes, taverns, sell for home banks, easy to make, keeps winners separate, locked securely, inexpensive, pays for itself over and over again. Complete instructions, diagram $1.00. Albright Sales, P. O. Box 241, Waukegan, Ill.

CUMMINS DIESEL



This front wheel drive reproduction of the widely acclaimed Cummins Diesel racer will be an outstanding addition to any modeler's display rack. The general lines follow the original car as closely as possible. The full-size plans include a bill of materials, concise instructions and many helpful photos. Send 50 cents to *Mechanix Illustrated* Plans Service, Fawcett Building, Greenwich Conn. Please specify Plan No. 431.

MEN-WOMEN! Let us prove how you can make Big Money at home making novelties, spare or full time. Absolutely no previous experience necessary. We supply names of interested buyers for your finished products. (Valuable Liquid Marble information.) Send for Free Catalog—"There's Money in Plastics"—Today! Write: Bing Products, MI-1152, Watertown 72, Mass.

SPARE TIME Business! Sell colorful Decalcomania Home Decorations for kitchens, bath, nurserys, gifts, etc. Friends, neighbors buy on sight. Millions sold every year. Start earning real money now. Up to 100% profit. Send postcard for sales plan plus test assortment on approval. Send no money. Decal Art Co., Dept. X11, 344 N. Lorel, Chicago 44, Ill.

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EARN $15,000-$30,000 ANNUALLY. Franchise protected. Guarantee minimum $12,500 or money back. Live at home. No merchandise to buy. Selfemployed. One of the most exclusive and noncompetitive businesses in United States. Send 50c for explanatory book. Money refunded when book returned. Harrell & Company, Box A-3, Louisville, Ill.

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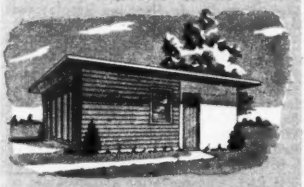

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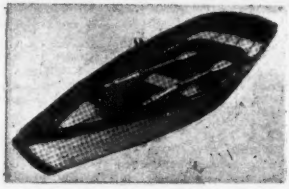

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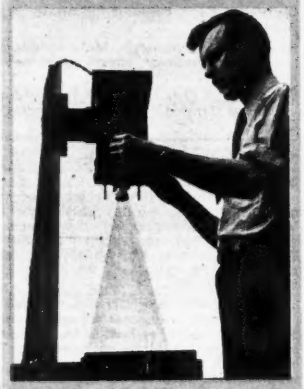

An MI project of especial interest to the minifan. This particular enlarger was built around a Leica though any other miniature can be used just as well. The drawings show very plainly all the parts needed to make this versatile little job. It features an arrangement that permits the film to be advanced without any chance of your favorite negatives being scratched as the condenser is lifted out of the way to advance the film. When lowered, the weight of the condenser serves to keep the film perfectly flat and in the focal plane. Blueprints and descriptive text are available from the MI Reader Plans Service, Fawcett Building, Greenwich, Conn., for 50c. Ask for Plan No. P-4.

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STYLING THAT INFLUENCES YOUR CHRYSLER-BUILT CAR

From the dramatic cars on this page — each an example of creative styling and engineering — come advances that appear in every Chrysler Corporation car.

Chrysler designers and engineers developed the K-310, the C-200 and the new Chrysler Phaeton to express certain ideas of construction and styling—to put to the test of steel and fabric their newest, most promising automotive developments. A superior motor car evolves; it does not suddenly come into being: these graceful, pleasing designs, and the lessons learned perfecting them, are reflected in the creation of your Plymouth, Dodge, DeSoto or Chrysler.

These, therefore, are "idea cars" — expressions in line and in form of the imagination always at work at Chrysler Corporation. Exciting outside and inside, they reflect continuing Chrysler principles—that beauty, in an automobile, follows function, and that car designs can best be created by designers *and* engineers, working together.

CHRYSLER CORPORATION engineers and builds PLYMOUTH, DODGE, DE SOTO, CHRYSLER CARS & DODGE TRUCKS

Chrysler Marine & Industrial Engines • Oilite Metal Powder Products • Mopar Parts & Accessories
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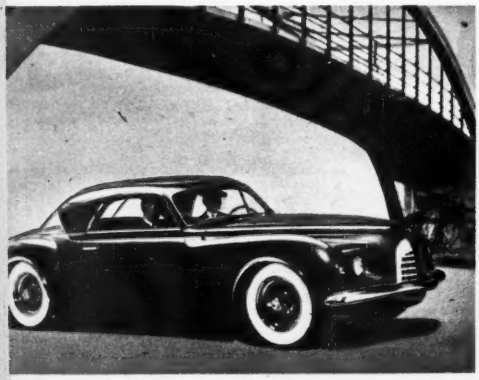
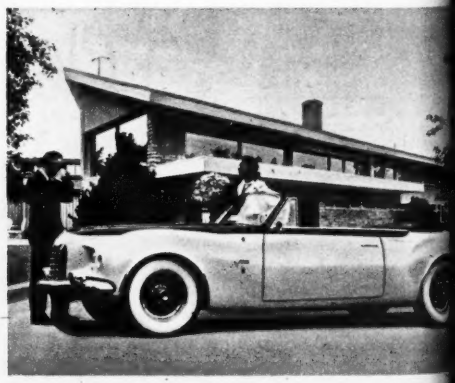


THE K-310, designed and engineered by Chrysler and handcrafted by Ghia of Turin, Italy. Only 59" high, with a wheelbase of 125½", it is designed to use the Chrysler FirePower V8 Engine and full-time Power Steering. This "idea car" represents an entirely new American theme in motor car functional styling.



The C-200, designed by Chrysler and handcrafted, like the K-310, by Ghia of Turin, Italy. It is powered by the Chrysler FirePower Engine and its brakes are the new, exclusive Chrysler self-energizing disc type. The handsome chrome-plated 17" wire wheels combine lively sports car styling with practical brake-cooling design.

Predict Your Own Future

Fortune telling is now big business. But learn the tricks and you can do it yourself.

By Lester David

SITTING tensely in a gilt chair, the wan young woman stared at the black-robed, turbaned seer. He asked her to write her name and address on a pad and to add the three questions she would like answered. The girl obeyed.

Lockhart

Is Your Hand Among These?

On these pages, MI has managed to accumulate a series of hand photographs as they were analyzed by one of the nation's leading palmists.

1 **STUDIOUS PERSONALITY.** 2: very sensitive. 3: lacks initiative and responsibility. 4: good balance. 5: independence of thought. 6: does too much with hands. 7: good mentality. 8: sentiment governs career. 9: avoid quarrels.

2 **USEFUL PERSONALITY.** 2: inventive. 3: imaginatively jealous. 4: leans toward public life. 5: should strengthen independence of thought. 6: must finish things. 7: will outlive wife. 8: appreciation late in life. 9: great personal pride.

3 **COMPLEX PERSONALITY.** 2: refuses responsibility. 3: theoretical. 4: demonstrative. 5: leans toward mysticism. 6: bad health. 7: no consistent future. 8: should not enter into any partnership. 9: very definite strong artistic tendencies.

1

4 **MATERIALISTIC PERSONALITY.** 2: inclined to be bigoted. 3: disappointment in love. 4: long life. 5: much money and opportunity. 6: bad temper. 7: many changes of job. 8: career influenced by love. 9: should not seek advice.

5 **PRACTICAL ARTISTIC PERSONALITY.** 2: strong mental support in event of illness. 3: would make good partner in business or marriage. 4: change in life toward more control. 6: can be righteously indignant but loyal to friends.

6 **INTELLIGENT PERSONALITY.** 2: daring. 3: balanced. 4: tied down and managed too much in youth. 5: now giving vent to feelings. 6: uncertainty. 7: needs open air. 8: should move carefully. 9: loves only once. 10: can't control people.

4

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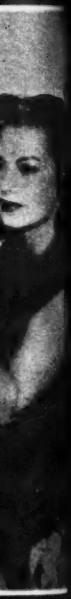


Palm reader Mohamed Mohamed Gaafar, center, tells the fortune of Sheppard "Abdullah" King, Texas oil millionaire who recently married belly-dancer Samia Gamal, left. The seer predicted great happiness for the couple.

"You see," explained the fortune teller amiably, "writing the questions will fix them more securely in your mind and I will be able to see more clearly what the future holds in store for you."

When the girl had finished, the mystic—who was one of the most financially successful crystal gazers in New York City—told her to slip the sheet of paper into an envelope and seal it. He took the envelope and dropped it carelessly over a book at his elbow.

Then the job of fortune telling began in earnest. The seer gazed steadily into a crystal globe the size of a man's head, which rested on a wooden stand atop the black, velvet-draped table. He sat motionless for five minutes, then spoke slowly:

"Your name is Andrea May. Your husband has left you and does not know that you are expecting a child. You want to know if you should try to find him and tell him. That is your only question. You did not write three."

The girl was stunned. It was all absolutely true. He had actually read her mind in his crystal ball!

But *had* he?

What Andrea May did not know was that the old mystic was just an old fraud who hadn't read her mind at all—he had just read her question. The book upon which he had put the envelope

5

6

containing the information was nothing but a hollow rectangle into which a powerful flashlight had been rigged. Shielding it from the girl's eyes with his flowing sleeve, he had merely snapped on the light which shone through the envelope and enabled him to read quickly what she had written.

But, can all fortune telling be explained by charlatanism such as this? Are all the great wizards who purport to leap the barrier of time into the shrouded future only tricksters in gaudy trappings who bamboozle you by fraud and dexterity?

Or do some practitioners of the mystic arts actually possess an unexplained power to divine what lies ahead?

This much is certain: never before in history has there been such a boom in fortune telling. Wizards, prophets, swamis, gypsies, prognosticators of every kind are packing them in at night clubs, plush hotel and apartment suites, elaborately decorated cultist temples, musty back rooms, tea rooms and even in drug and department stores.

They ply innumerable versions of the mystic trades—they gaze into crystals, read palms, interpret tea leaves in the bottom of your cup, use ouija boards, study the bumps and depressions in your skull. They divine the future from dice, dominoes and even sand. They read your forthcoming fortunes or misfortunes in the stars and planets, in your name and birthdate, in cards, handwriting and coal embers. They make prognostications from the number and position of the moles on your body, the proportions of your face and the doodles you scribble.

Nobody knows how many millions of Americans consult these oracles, but according to a recent estimate, a grand total of $300,000,000 is paid to fortune tellers each year by eager customers. Individual fees range from coins to more than $100 in the swankier salons.

That's important money. Is it all going down the drain in one big, glorious swindle? Or are the customers getting something for their cash?

Leading scientists and investigators frankly have no truck with fortune tellers, agreeing that none of the methods has scientific validity. The Smithsonian Institution, one of America's great scientific organizations, recently declared it has no evidence which it considers as proof that the fortunes of individuals can be told by fortune tellers.

Dr. Alexander Macalister, famous British scientist and teacher, says it is fantastic to believe that purely mechanical arrangements can have any predictive meaning and concludes: "Its discussion does not lie within the province of reason."

Tea-leaf reader Madame Wayne, top, points to the symbol C which means that the tea drinker will make a new business contact. Above, a crystal-ball expert gazes into the clouded sphere.

Many states have made the telling of fortunes for money illegal, but enforcement is extremely difficult since the law leaves many loopholes. A "futurist counselor" only has to tell you he doesn't claim occult powers in order to be safe even though he may proceed to unravel the future for you.

Mrs. Mary A. Sullivan, former chief of policewomen in New York City, arrested many female fortune tellers after approaching them disguised as a paying customer. "I had my fortune told innumerable times in a wide variety of ways," she declared, "and in all that time no one ever

Ouija board is supposed not only to answer questions about the future but to receive messages from the dead. Participants place fingers on tiny triangle on board. If concentration is deep enough, the triangle moves about board, spelling out answers to queries.

guessed what really was going to happen—that I was a policewoman and was getting set to snap the handcuffs on them."

That's one side of the picture and it all adds up to a pretty jarring indictment of the so-called predictive professions. Is there any rebuttal?

This is what a well-known New York City palmist says:

"Sure, there are frauds and cheats operating, but aren't there bad apples in every profession? Law has its shysters, medicine its quacks and there are crooked garage mechanics, plumbers and tradespeople. Our field has always been rich in prospective profits, so it is no wonder that the chiselers flock in to grab off the easy money from the gullible. The tricksters are so numerous that the hard core of honest practitioners who really believe in their art is buried beneath the sham."

But where is the proof? The question was asked of a dozen fortune tellers of every type and this was the sum total of their answers: "What greater proof does anyone require than the irrefutable fact that it works, that things predicted have come to pass? The proof of the pudding is in the eating—the proof of the predictive sciences is in the happening."

Such as? Well, Mrs. Litzka Raymond, a student of palmistry who has written a book and many articles on the subject, is extremely conservative about the fortune-telling aspects of palm reading. She ridicules claims of [*Continued on page* 162]

He Breeds Mink Coats

It's a tough racket, says this rancher, and there's many a slip twixt a mink and a fur coat.

By H. W. Kellick

SOME months ago a shiny, red convertible pulled into the driveway of the Lederle Laboratory with an unusual passenger in the back seat. It was a German shepherd named Smokie. She was politely escorted by the chauffeur into a large building on a secret mission—a mission that had stumped the scientists. It involved

Feeding time at the Ramapo Mink Ranch, top. Each animal eats about one-half pound of fish-horsemeat mixture per day, matures rapidly.

At pelting time only carefully selected mink are used. They are killed quickly and humanely by hand so the fine fur won't be damaged, top.

Pesner assembles a bundle of matched pelts, scraped and stretched, preparatory for shipment to market. Skins are dried inside out, above.

His young son, Alan, also is interested in the critters. He watches his pet, Bobo, swimming in his water tank, above. Bobo is semi-tame.

a small herd of wild mink on the loose.

The animals, it seems, were being tested with a new vaccine to prevent a mink disease. During the inoculation the little black weasels objected viciously by squealing like mad and biting the hands that held them. Finally they displayed their cunning by escaping entirely and for hours they managed to elude the men of science.

Worn to a frazzle, the Lederle men phoned Hy Pesner at his nearby Ramapo Mink Ranch. Could he solve their dilemma? Hy offered a solution. It was Smokie.

An expert mink herder, the six-year-old Smokie picked up a scent where a mink touched the ground and tracked down the

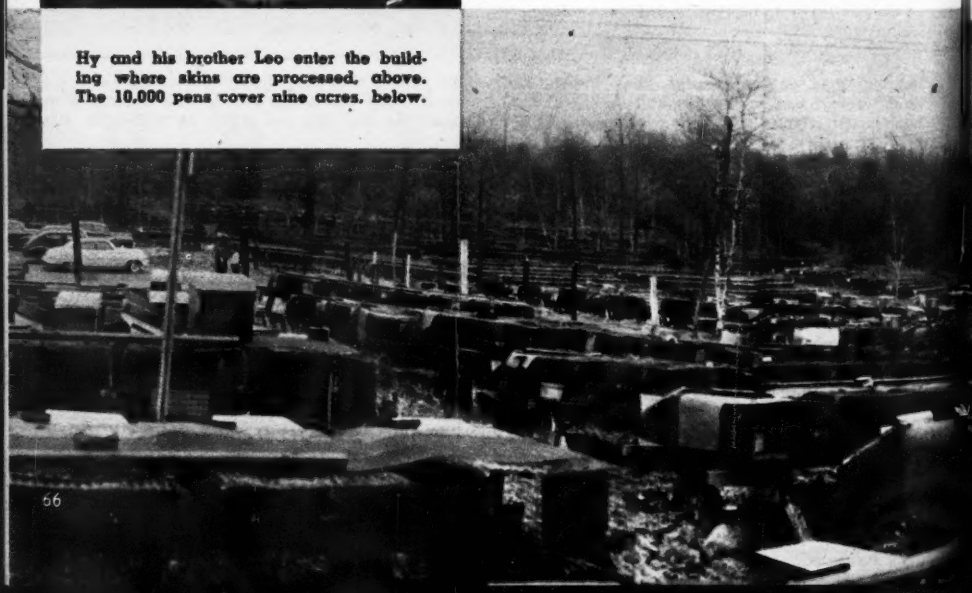
When a mink escapes Pesner yells, "Mink out!" and Smokie and a bloodhound, recently trained by him, come a'running to take up the chase.

They don't attack or grab the animal but simply corner it so it stops running. A mink usually makes for a stream or lake once it is loose.

Hy and his brother Leo enter the building where skins are processed, above. The 10,000 pens cover nine acres, below.

first fugitive in less than a minute. She didn't touch it but merely circled the squealing rascal until it cowered. Then a scientist grabbed the mink and returned it to its cage. Within an hour, all 15 errant animals were safely back in their cages, thanks to the dog.

Smokie is just one of the hired hands on Hy Pesner's Ramapo Mink Ranch which spreads its pens over the Ramapo hills in Spring Valley, N. Y. And she represents the solution to just one of Hy's problems. Mink raising is no bed of roses. Ask Hy and he'll tell you straight from the shoulder, "If I had my chance over again, I'd never do it. Not because it's not profitable but mainly because it's rough—very



When the mink has been stopped, the rest of the job is up to Pesner. From 15 feet away he leaps through the air to pounce upon the fugitive.

They belong to the weasel family, are extremely vicious and must be handled with thick, canvas-leather gloves. Bites are liable to infection.

rough." Take the time, for instance, a few years ago when he thought he'd solved his feed problem with a carload of horses he bought from a dealer in North Dakota.

When Hy examined the shipment on a railroad siding three miles from the ranch, he blinked and threw up his hands in despair for instead of tame horses which he thought he had ordered, he was stuck with 21 wild broncos.

"What a job we had getting them to the ranch," he comments. "Then we had to build a corral for them. The first night I awoke around one o'clock and thought I was out on the Texas range. I heard 'Clumpety, clumpety-clumpety' and jumped up to look out the window just in time to see the whole herd flash by." They had broken out.

Next day Hy put on a sombrero (he's worn one ever since) and took after them. He rounded up all but one. After hours of search he suddenly found it. He was riding it.

Most of Hy's troubles as a mink rancher seemed to pop up when least expected.

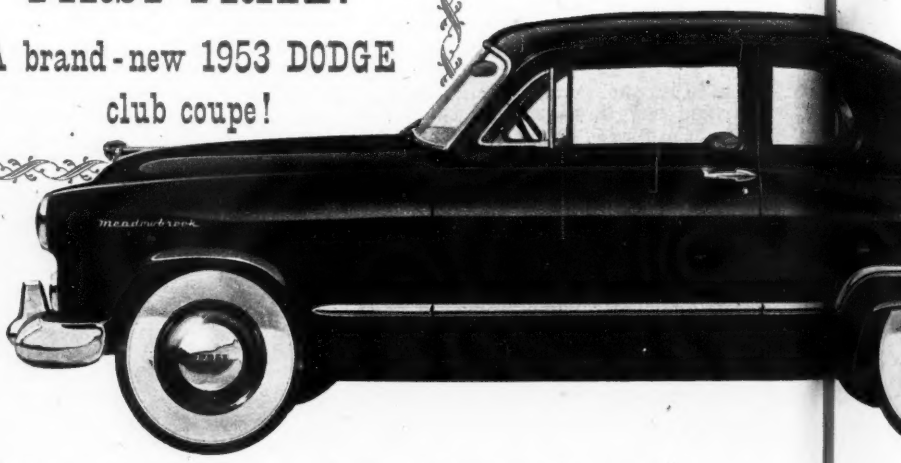
On the night of the big blow in the fall of 1950, for example, Leo Pesner stuck his head out of a window in the main ranch house and thought that he was seeing things. Quickly he summoned his brother. "Look, Hy," he shrieked, "it's raining mink." [*Continued on page* 168]

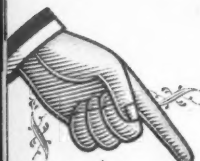
Announcing... By

MI's 2d OLD

FIRST PRIZE:

A brand-new 1953 DODGE club coupe!



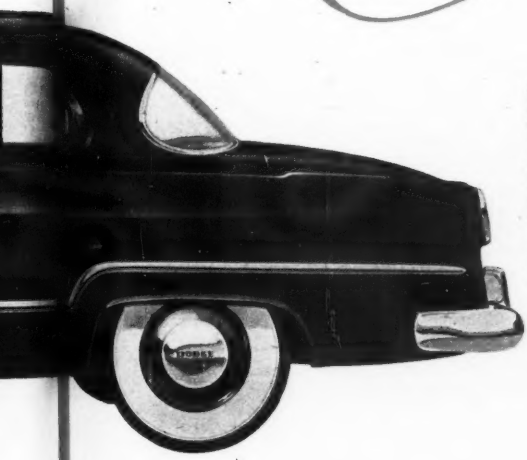


ABSOLUTELY FREE!

There's nothing to buy, no box-tops to submit, in MI's all-free, all-fun Old Automobile Contest! You can win yourself a beautiful new Dodge coupe simply by identifying some of the famous old-time American cars of yesteryear! Everybody has a chance to win a new car, or a big cash award, in the second edition of this sensationally popular contest!

Popular Demand!

AUTOMOBILE *Contest*



EXTRA PRIZES:

Hundreds of dollars in CASH!

Official rules and entry blank in the December issue of MECHANIX ILLUSTRATED . . . On sale everywhere about November 20.

PARADES FOR SALE

WANT to buy a parade? You can have it any length up to a mile with floats, balloons, clowns and music. And the price is right, too.

One-time immigrant from France, Jean Abel Gros, sells such shows all over the United States in cities large and small. At his Pittsburgh, Pa. headquarters, Gros creates figures in plastic and rubberized cloth. There are over 250 stock characters representing a value of around $30,000.

The show is on the road all the year round. Customers are usually local department stores, chambers of commerce or community groups of various kinds which get their packaged parade for anything between $1,200 and $6,000 with publicity thrown into the bargain. •

Jean Gros drafts most of his rubber and plastic characters himself, borrowing personalities from fairy tales, popular cartoons and comic strips.

After the drawing board stage, the models are carefully scaled and the materials cut to measurement. Then, the parts are geared to one another.

Pluto the dog, one of Gros' most popular paraders, is filled with air section by section. He's so large that the men working on him look like dwarfs.

Standing on a pile of giant funnymen, Gros puts the finishing touches to the face of one of the balloons. He has to be handy with the pallette.

Some of the creatures in the Gros parades are a combination of mythology and Gros' imagination. This strange-looking rubber monster, for example.

Space ship, with glass-enclosed control room painted on the nose, looks just like a rubber animal as Gros employes start to fill it up with air.

THIS MONTH'S PRIZE

gadget

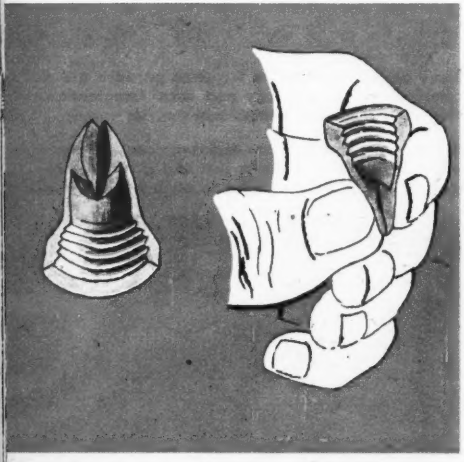
Self-Sealing Tube Cap

FIVE sons were just too much! Ben Gassaway had reached a point where he couldn't bear going through the ordeal of the messy bathroom sink every morning—he'd find caps off the toothpaste and shaving cream.

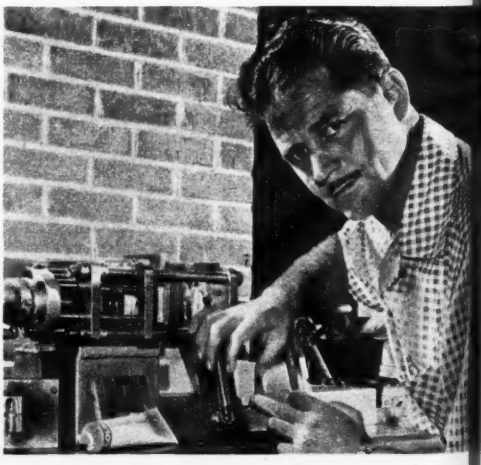
So he ranted. Mrs. Gassaway listened calmly. "The only logical way to solve the problem, dear," she said, "is to invent a cap that doesn't have to be taken off."

Mr. Gassaway got busy in his workshop and eventually came up with This Month's Prize Gadget—a self-sealing plastic cap with a tricky pressure chamber inside which makes it impossible for the tube to leak.

Now the sink is neat again and the Gassaway family has MI's $50 award, which should cover a new supply of toothpaste and things. •



Cross-section of cap, above, shows it open when squeezed edgeways, left. Pinch to seal, right.



Inventor Ben Gassaway turns out one of his caps in workshop of Milwaukie, Ore., home.

750,000 Platter Chasers

You'll find America's newest hobby fanatics—the record collectors—combing junkyards and attics in search of unusual discs.

By Harry Kursh

FIVE years ago, a platterbug named Jacob S. Schneider started collecting records. He spent between $2,000 and $3,000 and managed to accumulate 175,000 discs. If he sold them tomorrow, experts estimate he could realize a cool profit of $250,000!

Schneider's feat does not stand alone. In

In back of his New York law office, Jacob Schneider, top, catalogs some of his 175,000 records. Above is a rare Valentino disc which Schneider got in a trade for 15 records.

Disc jockey Joe Franklin has every record ever made by Bing Crosby, Eddie Cantor and Al Jolson. "I have more of Bing's records than he has himself," Joe recently boasted.

the last decade, record collecting as a hobby has grown to gigantic proportions. According to leading experts, there are already close to 750,000 ardent collectors in America. They are spending untold millions for records. Many buy their discs for as little as five cents each and sometimes for as much as $100 per recording. But they frequently re-sell the discs to other collectors and music lovers at ten times the purchase price.

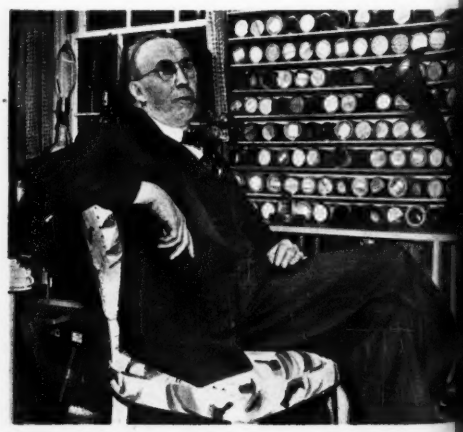
Schneider, a busy New York lawyer, started by buying a phonograph as a gift for his son. Then he went out to buy a special group of jazz records to go with it and discovered that he would have to pay $2 and $3 each for records that sold for less than 50 cents each when they were new.

"I thought the price was outrageous," says Schneider. "But everyone told me, 'Mister, you can't get these for less. They are collector's items.' "

Then, one day, returning from a New England vacation, Schneider saw a junkman removing thousands of old records from a home in a small town. He went over to glance through the records and saw dozens of the type his son wanted. So he bought the entire load from the junkman—several thousand records—for $20.

"I became a record addict almost overnight," Schneider reports. "My son got about 50 records, for which I would have had to pay more than $125, and I catalogued the rest. Then I began trading with others." Today, Schneider is considered the nation's largest collector of recorded popular music.

One New Yorker started his collection



Antique record collector E. G. Hamer has thousands of cylinder and disc-type records as well as the machines to play them on. Some date back to 1887.

with a few records he picked up at eight cents each in a junk shop. That was in 1948. Today, still just a hobbyist, his collection exceeds 20,000 discs and he figures many are worth anywhere from $50 to $1,000 each, although he only paid a fraction of the price when he bought them from people who thought old records were just a lot of junk. His entire collection is insured for $150,000.

The actual number of records produced by each company is a closely guarded trade secret. But according to the best estimates of industry experts, there are approximately 100 companies here and abroad producing close to 200,000,000 records annually. And nobody knows just when or how anyone of these might become invaluable.

In Chicago, not long ago, a discophile got $50 from Paul Whiteman for lending him the recording of a song called *Do You Ever Think of Me* for a single radio broadcast. And it had been made by the famous band leader himself when he had only nine men in his band. He needed the record for one of his special radio performances and was unable to buy it at shops.

A Philadelphia street cleaner became a record collector after he found a batch of old jazz records in a garbage can. They amused his family so he decided to expand his collection by trading. In the process, he learned that one of the records, containing two numbers called *Zulu's Ball* and *Workingman's Blues*, made by the late Joe (King) Oliver in 1923, was a collectors' item.

Oliver, a famous New Orleans jazz musician who inspired Louis Armstrong, made that one record privately and no others are known to exist. Its owner now keeps it under lock and key. So far, he's received a top offer of $5,000.

"Eventually, some people will collect records as they now collect paintings by Picasso and Rembrandt," says Robert H. Reid, an editor of *The Gramophone Shop Encyclopedia of Recorded Music*. "I know collectors who list many of their discs at prices up to $100 each."

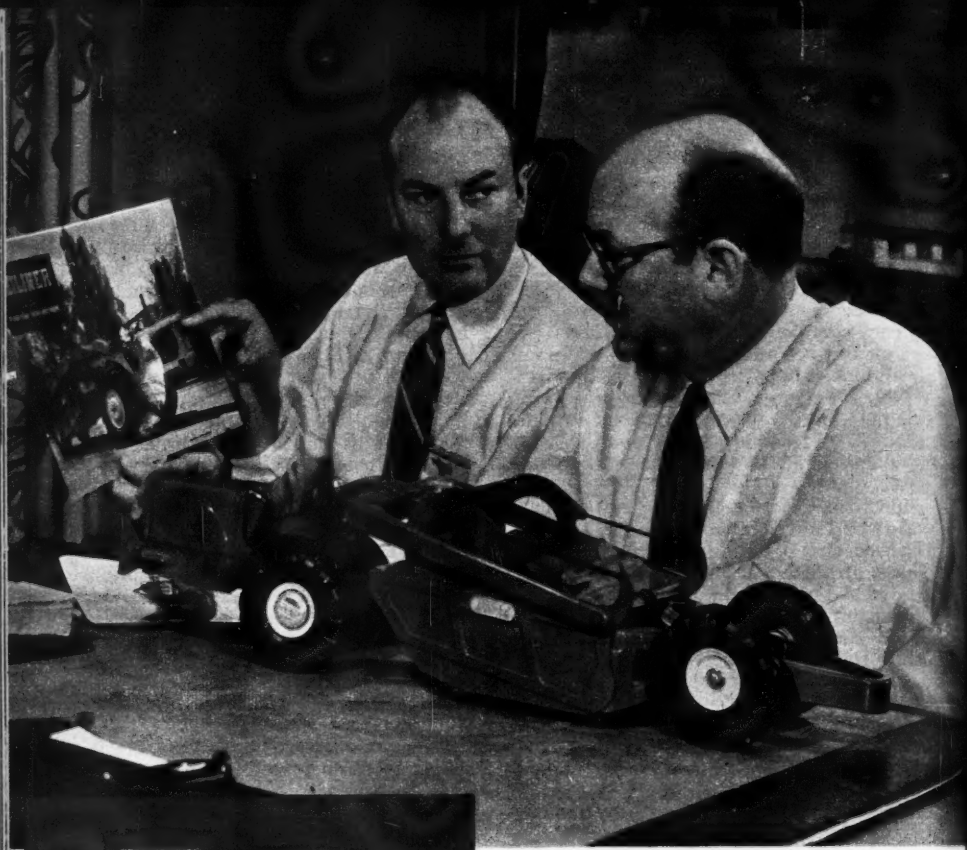
Some of the world's leading personalities in the world of art, business, science and politics go all out for record collecting: Bing Crosby (and all his children); Eugene Grace, president of Bethlehem Steel; most of the Ford and Vanderbilt families; famous authors Clifford Odets and Ludwig Bemelmans; Hollywood star Montgomery Clift; celebrated cartoonist Peter Arno; Britain's foreign minister Anthony Eden; publisher Alfred A. Knopf, and Nelson Rockefeller are just a few of the most enthusiastic record collectors.

Most collectors are in it for the amusement and thrills they get out of having an unusual collection of discs. As a fun-producing hobby, probably few others can compare with record collecting. It's probably the only hobby in which you can, on a moment's notice, share the fruits of your work with others. You don't have to explain intricate details or lecture first on the complex technical points of what you have done. All you need is a phonograph and a circle of friends about you.

But leading disc [*Continued on page* 172]

Ex-heavyweight boxing champ Joe Louis is an avid collector of jazz records. He claims that they helped him relax the night before his fights.

Movie actor Bill Bendix is another disc hobbyist. He prefers the masters of jazz although his collection includes modern as well as vintage favorites.



Toys for Peace

Fred Doepke, left, vice-president, shows his brother Charles, president, of the Charles William Doepke Manufacturing Co., how their new model Heiliner compares in detail with its big brother.

PLAYING with toys can be fun—and profitable, too.

Take the case of two Cincinnati brothers, Charles W. and Frederick W. Doepke. They have parlayed a liking for toys, an idea, and $1,000 capital into a highly successful toy business developed from

Model grader of steel weighs over 14 pounds. It has adjustable scraper blade, steerable wheels.

True-to-scale mammoth Euclid bottom-dump truck has detachable tractor, control for dump doors.

Scene in the Doepke plant shows wheels and axles being mounted on scale-model American-LaFrance fire trucks, top. In service department, above, damaged toys are inspected, repaired for $1.

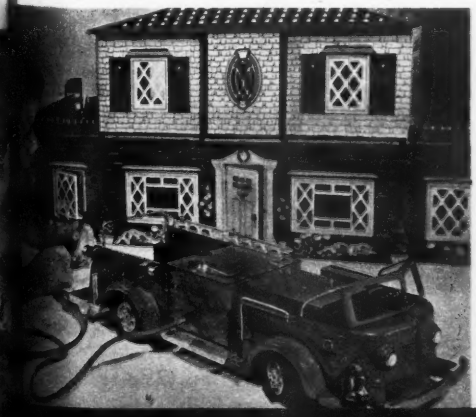
Latest model is the Cat, top, replica of the famous bulldozer built by Caterpillar Tractor Co. It is one-twelfth life size. Above, a happy youngster moves earth with his model Heiliner.

scratch during the last five years.

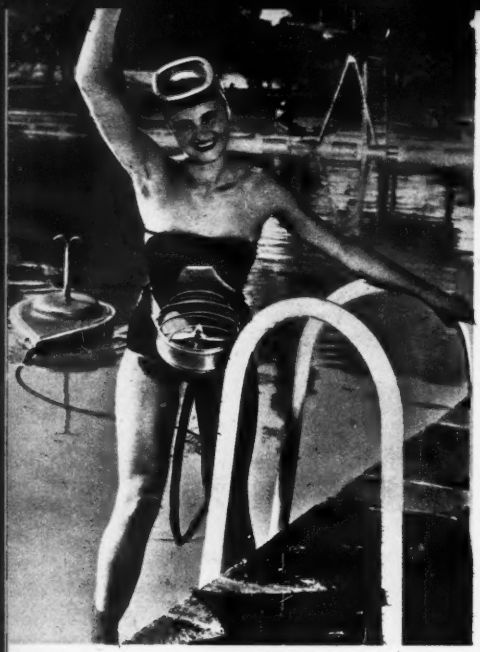
The idea started just before Christmas in 1945. At that time the brothers were operating a small machine shop that had produced ammunition containers and tank tread pins during the war. Fred was just back from service as a fighter pilot and the brothers were looking around for business.

Then their mother came to them with a problem. She had been Christmas shopping for her grandchildren. She lamented that all she could find were toy machine guns, pistols and other types of play weapons. [*Continued on page* 176]

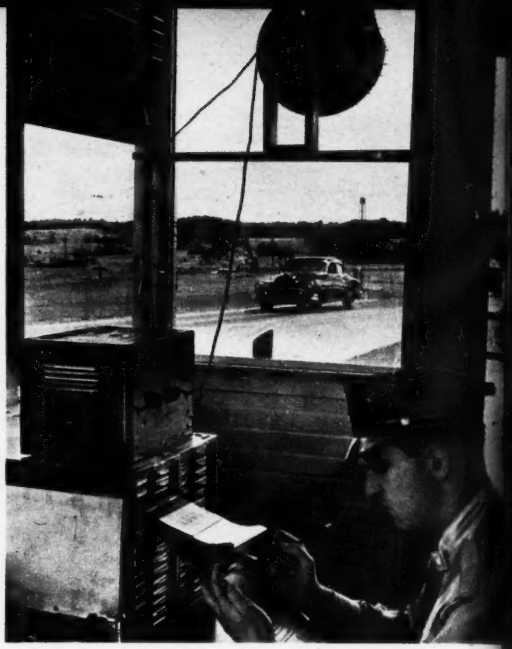
Rubber hose and pump to squirt real water are features of the American-LaFrance ladder truck.



Outriggers and jacks enable this Unit Mobile Crane to lift heavy load. Crank controls boom.



Water Horse is a built-in drive for swimmers. Propeller strapped to waist is linked by cable to a snorkel-equipped motor behind. Speeds up to ten miles an hour are attainable. Price is $188 in Munich.



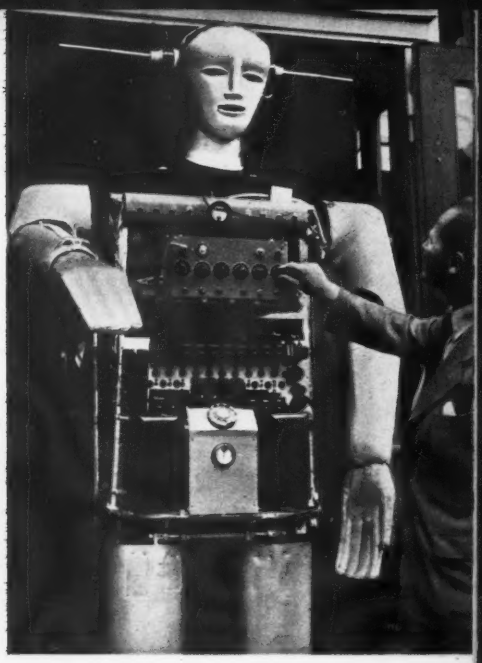
Electronic Watchman causes warning bell to ring when car approaches gatehouse at entrance of G. E. Research Laboratory. Reflector aims short radio waves at moving object. Echo rings bell.

NEW in SCIENCE

Aluminum Shields protect police in Osaka, Japan, whose job it is to break up Communist disturbances. Their main weapons against offenders are short clubs. Shields ward off knives and rocks.

Inside-Out Tent designed at Fuller Research Foundation, erects in 25 minutes, won't blow away in a blizzard. It will be used in Arctic explorations. Interior is insulated with bags. Weight: 140 pounds.

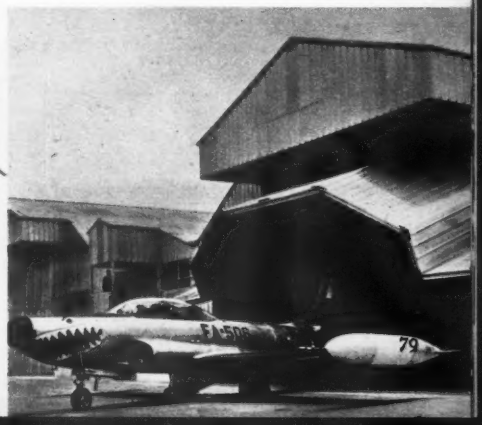
Doughnut Glider is displayed at Aachen University in Germany. It is six feet in diameter, but a full-sized glider complete with round hole in center is in production. Pilot will sit in the front.



Louie The Robot can walk 15 miles alone, move backwards and forwards and execute 24 distinct movements. Transmitter and receiver aerials project from his head. He can speak, sing, and smoke cigarettes.

Portable Respirator covers the chest and abdomen. The long, cuirass-type respirator is being attached to polio victim by Dr. Whittenberger, Professor of Physiology at Harvard School of Public Health.

Push-button Hangar on main runway of Selfridge Field in Detroit saves five to eight minutes by its quick-opening doors when alert sounds. Ground crew is protected from exhaust by a steel screen.

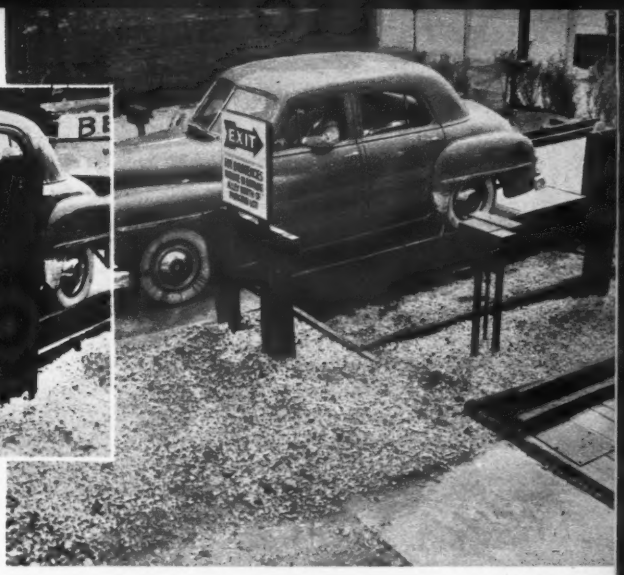


MECHANIX ILLUSTRATED

PIN-UP CAR

1903 Orient Buckboard

Owner: Louis R. Biondi, Waterbury, Conn. Engine: 2-cylinder air-cooled, 8 horsepower, 3¼-inch bore, 4-inch stroke. Gas consumption: 30 miles per gallon. Weight: 550 pounds. Wheel diameter: 28 inches. Body color: natural wood. Fender color: mahogany. Top speed: 26 miles per hour. Won first prize for best restored car at Antique Automobile Show held in Old Deerfield, Mass. in 1950. Car steers by tiller bar.



Automatic Parking Lot works by coin meter. Inventor Bill Spencer of Chicago drives his car on platform, deposits coin. Platform moves to right permitting car to enter past barrier. Exit from lot is made the same way from parallel platform.

WIN $25

Send in a sharp, glossy photo of a snazzy car, old-timer or new, posed as at left with owner or a pretty gal. Include self-addressed, stamped envelope (just in case) and all vital statistics about car and owner. Mail to Pin-Up Editor, MECHANIX ILLUSTRATED, 67 West 44 St., N. Y. 36, N. Y.

NEW for the ROAD

Dual Brake Control attaches to brake pedal of standard make cars, extends across floor to instructor's seat. By pressing on it he can slow down car or stop it completely. Installed in a few minutes. Seyber Mfg., POB 557, Lynbrook, N. Y.

MI Tests the 1953 Kaiser Manhattan

Comparatively light for its size, the Kaiser can do 90 mph and corners "fairly evenly," Tom found.

By Tom McCahill

TEN tons of leaves have fallen off the old oak tree since Henry Kaiser started his putt-putt business right after the war in the huge ex-bomber plant known as Willow Run. When he announced to the world that he was about to get on the automotive target with a real low-priced, front-wheel-drive buggy, Detroit pricked up its ears. After all, Henry was the guy who did the impossible during the reign of Adolph Hitler by smashing the centuries-old tradition that to build a ship takes a lot of time. He whipped out Liberty ships as fast as they throw hamburgers together in Joe's Diner. Henry Kaiser was the acknowledged production hero and genius of World War II. He brought new methods and ideas into a business unfamiliar even to him and in less time than it takes to grow a short beard, new Kaiser-built Liberty ships were hitting the water with all the regularity of a trip hammer.

He hired an army of expediters to keep hard-to-get material rolling in and he had a fast-talking group in Washington to keep Kaiser's needs on top of the priority pole. To say that even the big guns of Detroit were a little uneasy when Henry dropped his hook at Willow Run would be the understatement of the century. He had teamed up with Joe Frazer, as old a hand and as experienced a man as any automobile executive in the country, and when Henry told the people his plans for a quality low-priced automobile there was reason for deep concern among cardom's old guard.

Production at Willow Run didn't get go-

"As comfortable as a wheelchair upholstered in cream puffs" is one reaction our Uncle Tom had to the brand-new Kaiser.

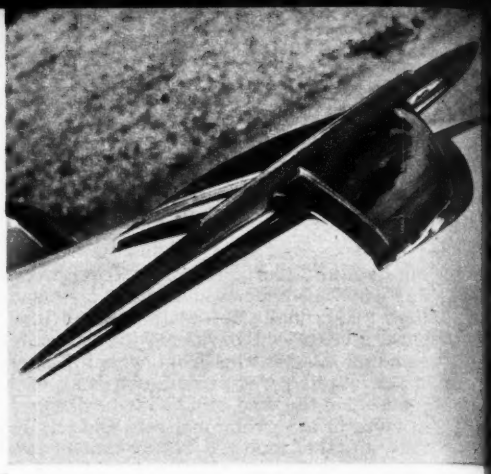
ing like the Liberty ship parade, however, and when the two new cars, the Kaiser and the Frazer, finally did hit the asphalt they were high-priced buckets with few outstanding assets. The front-wheel Kaiser which I tested was a real goon boat, as I reported at the time, and had to be dropped in favor of a conventional rear end job. In the years that followed, Kaiser made good, reliable cars as exciting as a cold cup of coffee and the more expensive Frazer was, for all practical purposes, just a dolled-up Kaiser with a bigger price tag.

A little over two years ago Kaiser at last introduced the low-priced rig he yelled about when he first tackled the horseless carriage rat race. With the Henry J he had a little bomb that was the lowest-priced car on the American market with the exception of the Crosley. This item, with its four-or six-cylinder engine, has ever since been as hotly praised and run down as the Taft-Hartley Act. About this time Joe Frazer dropped out of the partnership and so did the Frazer car. Howard Darrin, the famed designer, helped Kaiser hit the 1951 market with what many people consider the best looking car in the U.S. In Europe the Kaiser walked away with the best looking prize over all American offerings, regardless of price, and that brings us smack up to the 1953 Kaiser line.

Despite anything said to the contrary, the 1952 Kaisers are handsome automobiles by American standards. The 1953 jobs are even better looking and everything from their tasteful upholstery to their smart safety-padded instrument board reflects the best of American contemporary style. These are medium-priced luxury barges that are as comfortable to ride in as a wheelchair upholstered in cream puffs. They are roomy, quiet and stable.

This year's car is pretty much like last year's, mechanically, with the exception of some manifolding and carburetion changes. The horsepower has been raised by this alteration from 115 to 119. I tested two 1953 Manhattans, one with Hydramatic and another with overdrive. Let's take a look at how they compare. Zero to 60 all the way in the Drive range of Hydramatic took, on a corrected speedometer (both cars were nine miles an hour fast at 60), exactly 20.5

Europeans voted the 1951 Kaiser "America's best-looking car." Tom says this year's looks better.



Massive use of chrome trim, front and rear, is a characteristic of the Kaiser line, as are the cupid's-bow-shaped windshield and back window. This year's power plant has been upped to 119 hp.

Streamlined hood ornament at top is new. Huge rear bumper shown in bottom photo affords good protection for the Kaiser's rear end. Despite its husky appearance, sedan weighs 3,150 pounds.

seconds. Using the Low range to about 40 and shifting into Drive lowered this time to 19.8 seconds. With the car equipped with overdrive, zero to 60 on a corrected speedometer averaged 17.5 seconds, with one run of 17.4.

This three seconds difference between the Drive range of Hydramatic and overdrive is a lot greater, and a great many car lengths faster, than the three seconds show on paper. Top speed on the overdrive car was a solid 91 with the speedometer showing 104 mph. Top speed with Hydramatic was 90, with a speedometer showing 103. I actually expected a bigger difference between the two cars at top. But there it is and all times were made on two-way runs over a measured mile, near Willow Run. A solid 90 or 91 mph with 119 horsepower in a big car is really pretty fast. There is a reason for this. The car is comparatively light, considering its size, and only scales at 3,150 pounds for the four-door sedan. A 1952 Ford V-8 hits the scales at 3,200 so it's safe to say the big Kaiser weighs about the same as a Ford, Chevvy or Plymouth and has a lot more power than any of these three.

This job handles bumps well and by American standards corners fairly evenly but is a little slow in steering. From all the reports I have, the big Kaiser has an excellent record for reliability. And service, though not always elaborate, is nation-

wide and adequate. The Kaisers are tops in looks and the only possible drawback I can think of against making them the outstanding buy in their class, is their resale value, which is not always the best.

The Henry J for 1953 has undergone just a few minor looks changes. The car I took out was the very first off the new production line and had less than one mile on it so any accurate performance tests were impossible. This is an intriguing little can, as fresh as an unlaid egg. I never tested the four (and I don't particularly want to) but the six, when it's right, can be a wildcat. Lots of readers have written me that they find it tops for use in heavy city or suburban traffic. They can dart away from a traffic light like a stone leaving a slingshot. Furthermore, the six has a remarkably high non-blow-up cruising speed. Last fall I trailed a Henry J for more than a hundred miles on the Penn Turnpike, expecting it to blow over the landscape at any second. It was holding a steady 80 to 83 and that's something a lot of expensive cars can't do for such a long period without having something go poof.

At this moment a goodly size part of Willow Run is being used for making bomber parts. This has cut down production somewhat but I hope it is only a temporary block. We need independent automobile builders badly in this country to keep Detroit on the ball and to prevent the trend towards making all American cars look like General Motors products •

SPECIFICATIONS

MODEL TESTED:
1953 Kaiser Manhattan four-door sedan

ENGINE:
6 cylinder, L-head; bore 3 5/16 inches, stroke 4⅜ inches; piston displacement 226.1 cubic inches; maximum torque 190 foot pounds @ 1800 rpm; brake horsepower 119 @ 3650 rpm; compresison ratio 7.3 to 1

DIMENSIONS:
Wheelbase 118½ inches; overall length 211 inches; tread 58 inches front, 58 rear; weight 3,150 pounds; standard tire size 6.70x15

PERFORMANCE:

	(overdrive)	(Hydramatic)
0 to 30 mph,	4.8 seconds	
0 to 50 mph,	12.4 seconds	19.8 (Low & Drive),
0 to 60 mph,	17.5 seconds	20.5 (Drive all the way)
0 to 70 mph,	24.9 seconds	

Top speed, 90 mph (with Hydramatic), 91 mph (with overdrive)

Uncle Tom, below, shoots the first picture of the first 1953 Henry J to come off the assembly line. This year's model has few, minor changes.

Uncle Tom makes a swing through the great Italian motor plants and comes up with some exclusive dope on what's going on abroad.

By Tom McCahill

Italy's Motor

BACKED by a barge load of Uncle Sam's freely tossed greenbacks, Turin, Italy, has become the undisputed Detroit of continental Europe—and it did it in less time than it takes to say Willow Run.

The other night I was riding west in the club car of the Detroiter when the guy in the chair next to me remarked, as he read the paper, "I see Henry Kaiser just borrowed another $22,000,000 from the government." He then tossed in another couple of remarks as to how he wished *he* could borrow a few million from Uncle Sap.

As I had just returned from Italy a few days before, I couldn't help but be impressed by the sarcasm. From what I have heard, and I'm not in the least sure of my facts, Henry Kaiser to date has met all his notes and interest payments on money borrowed from Washington.

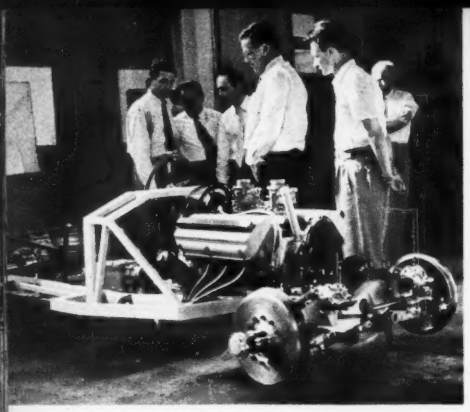
Outside Pinin Farina's celebrated body works in Turin, Tom saw this just-finished Ferrari, whose oval grille is almost as famous as the Rolls-Royce radiator and emblem.

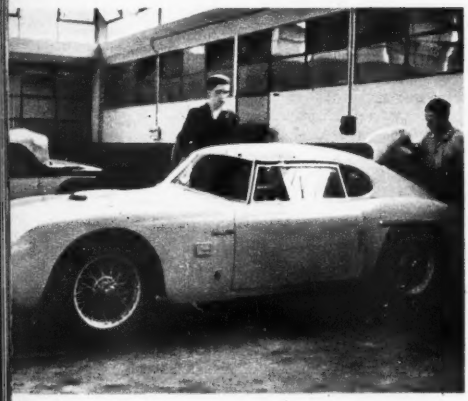
An overall view of the Farina-styled Ferrari shows the svelte curves and graceful silhouette of a car whose cheapest model costs $10,000.

Masterpieces

Lancia, another great (and expensive) luxury automobile, comes off Italian assembly lines at a rate of less than 50 finished cars a day.

Note the swept-in sides of this Osca coupe. In the 24-hour Grand Prix at Le Mans (to which it went on this trailer) the Osca didn't finish.



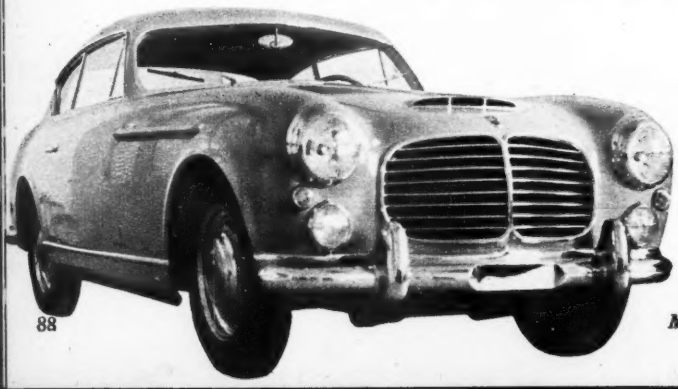


At the Siata plant (top) Briggs Cunningham, left, Alfred Momo, Phil Walters and Bill Spear look over a Chrysler-Siata chassis. Ultra-low car in bottom picture is a fast-moving Siata V-8 coupe.

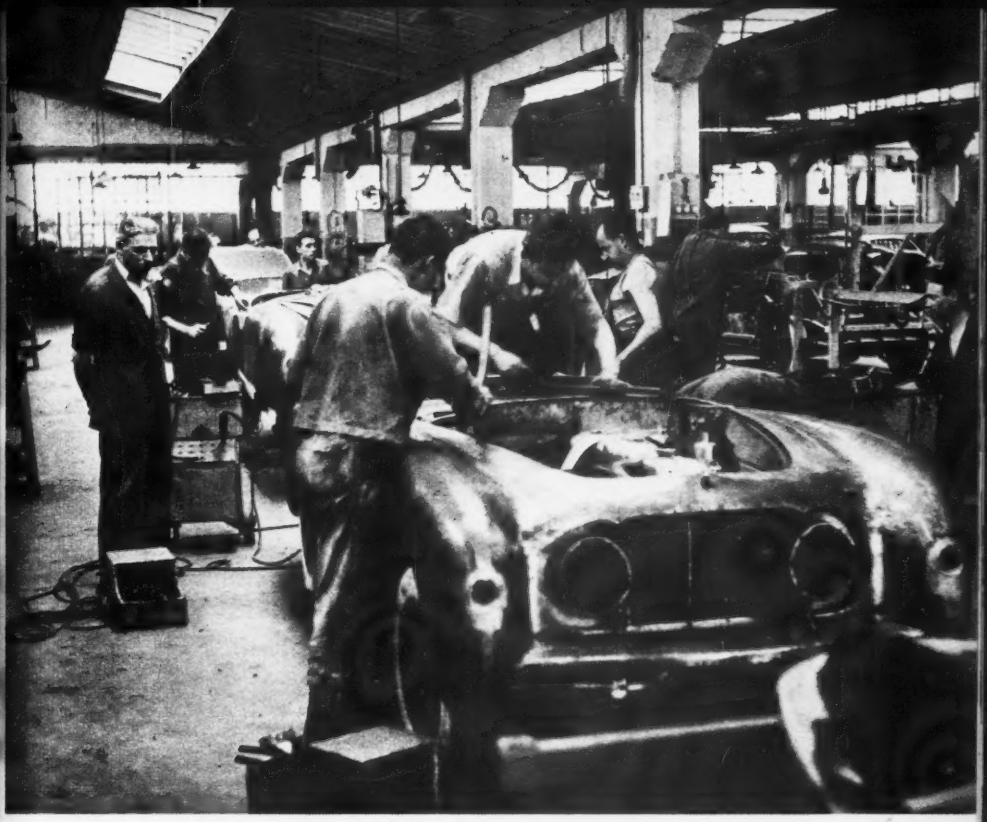
It's not hard to pick out Tom McCahill in this group outside the Lancia factory. Cunningham, at far right, is Mr. American Sports Car. His Vignale-bodied Cunningham coupe is shown above.

But the point is, $22,000,000 wouldn't pay the freight bill on the thousands of tons of ultra modern American equipment I saw in the auto factories of Italy—all shipped across the big pond by courtesy of good old Uncle Samuel. I wonder how much of that "loan" we'll ever see again?

Anyway, regardless of where the equipment came from, Turin—tucked away just a skeet shot south of the Alps, in the northern part of Italy—is a thriving industrial metropolis, the creative hub of nearly all fine automotive styling and chassis design in the world today. Its magnificent body building supply depots, its metallurgical know-how, and the superior skill of its engineers in the styling and suspension departments, make this pin-point on the globe



And here is a brand-new Maserati, another fine car of Italian design, waiting for somebody to come along with enough dough to drive it off the floor.



Bodies for the American Nash-Healey, right, are built in the Farina body works, above. Most of the heavy automotive equipment used in Italian plants bears U. S. A. seal shown at lower right.

one of the most important centers in the automotive picture.

Turin's plush Principe Piedmonte hotel (completely rebuilt with E.C.A. dough in '47) is just a grander version of Detroit's Sheraton-Cadillac, with the same steady stream of American automobile faces going through the lobby. Top men from Chrysler, Packard, Ford, Nash and Hudson, among others, are as common a sight in the elevators as the potted palms at a funeral parlor. If you think all the characters just happened to turn up here on a vacation trip, you can step to the back of the class, Buster. They are here to learn, have special experimental cars built, to try and grasp a little styling savvy—and in one or two not-isolated cases, they are here on missions of plain design robbery.

At Ghia's I saw the newest Chrysler prototype of its so-called sports car getting the finishing touches, just a few feet from a Ford-owned, [*Continued on page* 179]

Fecker 20-power target scope on Remington 721.

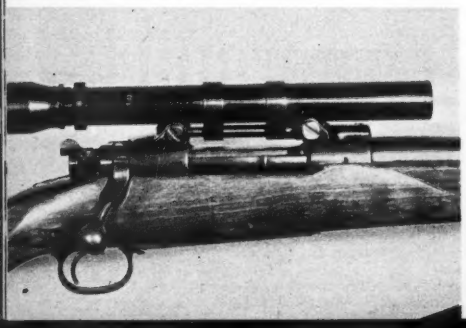
Lyman 3-Point Micro-Click rear mount for use with above and Lyman scopes.

Which Sight for Your Rifle?

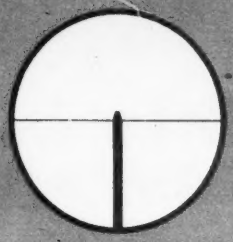
Get the one that fits your gun and game and your friends soon will be calling you "Old Deadeye."

By Raymond R. Camp
Rod and Gun Editor, N. Y. Times

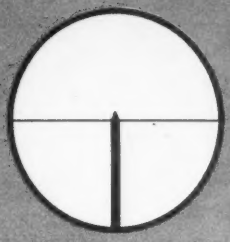
Bausch & Lomb 2½-to-4-power variable scope.



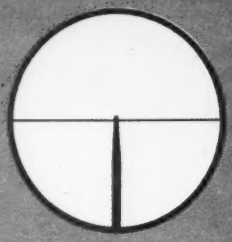
Lyman Alaskan 2½-power scope on Marlin carbine.



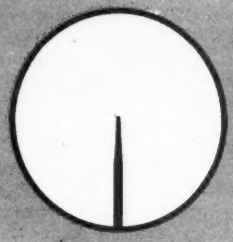
BLUNT PICKET POST AND CROSS WIRE



SHARP PICKET POST AND CROSS WIRE



TAPERED POST AND CROSS WIRE



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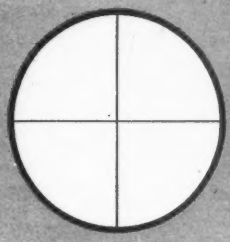
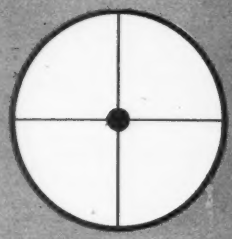


CROSS WIRES

TACK HOLE DOT



LEE DOT

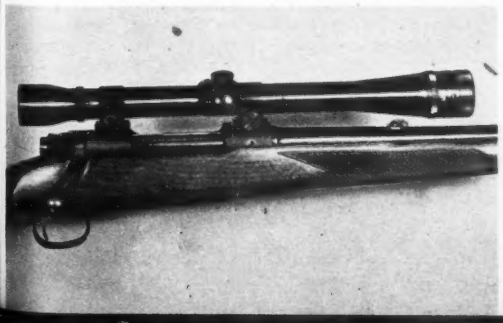
A GOOD, stout club or a pocketful of large rocks would be just as useful to a hunter as a rifle with a poor sight when it comes to bringing home some red meat for the deep freeze.

It has been said, and with far more truth than poetry, that a rifle is only as effective as the man behind it, and the man's effectiveness is limited by the sights he is using. Fortunately, hunters have become unusually sight conscious in recent years, and no one is happier over this state of affairs than the manufacturers of iron and telescopic sights.

For fast shooting, and for shooting in bad light, the old "leaf" sight, exactly the same in general design as the one great-great-grandfather used on his flintlock, is still effective. But you rarely see one of these sights on a modern rifle except on a .22 used for plinking or on the old "thutty-thutty" of a backwoods guide. The average shooter now prefers a peep sight and if he hunts in an area where long shots are normal, a telescopic sight has advantages far in excess of its cost. Also, as a result of its optical values, this latter can provide extreme accuracy under light conditions that would make effective shooting impossible with any form of iron sight, leaf or peep.

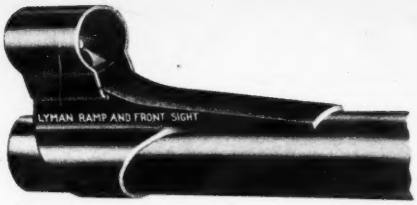
In recent years the telescopic sight has climbed steadily in power as well as popularity and as a result of the increased production has dropped considerably in price. Initially many of the telescopic sights were one power and ran the full length of the rifle barrel. Both weight and bulk were against them, so far as the hunter was concerned, and you seldom saw one except on

Weaver K-10 scope, 10-power, on Winchester.



Lyman Alaskan 2½-power on Winchester Model 70.

Lyman tang sight is a good hunting sight, folds for carrying, is popular with muzzleloaders.



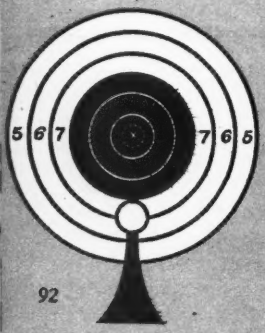
Popular with sporting rifles is the Lyman ramp sight with hood detachable for field shooting.

Excellent example of an optical peep sight is this unusual model handmade for Scheutzen match rifle. Below is Lyman Receiver Sight on Winchester 94.

the rifle range. Then they began to appear in reduced length and increased power, and today efficient scopes are available that provide 2¼ magnification and are less than three inches long. The majority of hunters, however, prefer the more sturdy scope of 10 or 12 inches.

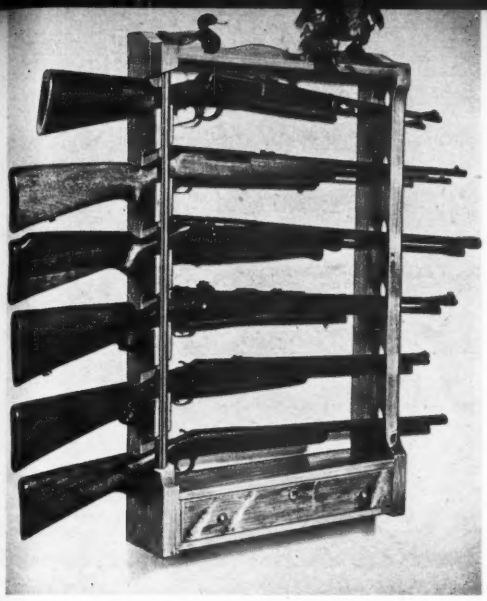
Today you can find a telescope sight for every purpose and several designed for a dual purpose—big game and varmint shooting. It has been argued that the eastern big game hunter whose short-range shooting, usually under 100 yards, does not require the scope for extreme accuracy, can eliminate it in favor of iron sights. Others argue that the very thickness of the cover that reduces the range also increases the value of this optical aid. In most eastern areas the hunter is limited to the buck deer, but many a hunter returns home without venison because he was unable to determine the sex of the deer because of the heavy cover. The man with a scope-sighted rifle usually can spot the antlers or lack of antlers in a second, and although the scope may add a little weight and be something of an obstruction in the brush, it is claimed that its effectiveness outweighs these faults.

Several makers now provide scopes with variable power adjustments which permit an optical [*Continued on page* 184]



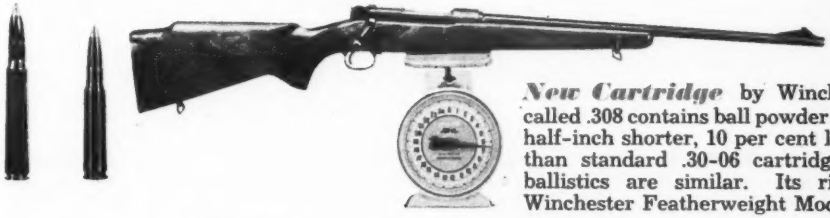
Tang and Receiver Sights do not obscure game on running shots, below on right, as does old-fashioned rear leaf sight, right.

Target your rifle before hunting. Sight-in so top of front sight will be held just below bull's-eye or vital area on game, left.



Tamper-Proof Rack locks away six of your favorite guns. Polished brass rod at left does the trick, opens when drawer is unlocked. Made in knotty pine finish. Yield House, North Conway, N. H.

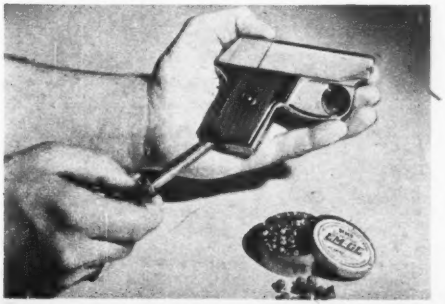
Hunter's Helmet of bright red is made of windproof, waterproof Vinylite for wet-weather hunting. Jacket, shirt and pants of same color are also available. Seal-Dri Sportswear Co., Rockford, Ill.



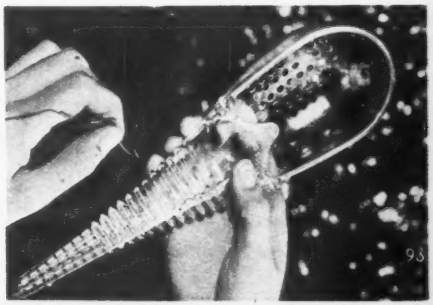
New Cartridge by Winchester called .308 contains ball powder and is half-inch shorter, 10 per cent lighter than standard .30-06 cartridge but ballistics are similar. Its rifle is Winchester Featherweight Model 70.

NEW for the SPORTSMAN

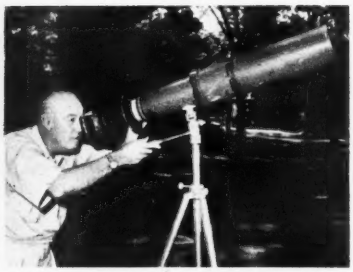
Blank Pistol can't shoot real bullets in spite of its authentic appearance. It holds six cartridges, loads and ejects automatically. For starting sports events. Godfrey Import Corp., New York City.



Hold-A-Mino scoops up a shiner from your minnow bucket and slides it head-first into its six-inch hinged handle which has open ribs so the hook can be inserted. Made of Tenite. P & K Co., Momence, Ill.



hobby
HALL OF FAME



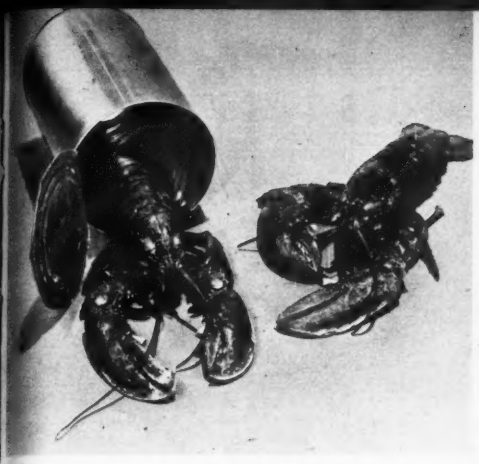
This isn't a telescope, just a 6.40mm lens combination hooked up to an Exakta, one of the outfits which makes possible unusual photos such as that of the baby Wood Ibis shown above.

S. F. BRIGGS— From Outboards to Birdography

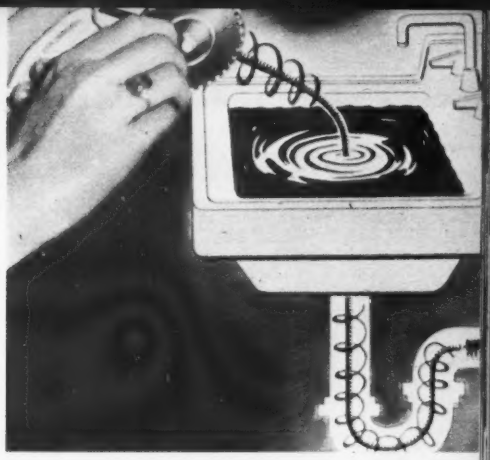
STEPHEN Foster Briggs is Chairman of the Board of the Outboard Marine and Mfg. Co. which makes Evinrude and Johnson motors but when his mind isn't on outboards it's on birds. And so is his eye because he is one of America's leading bird photographers, says Eastman Kodak. Most of his work is done with a 35mm camera and a 26 inch lens from a shallow draft surplus Army boat. He sneaks up to an island rookery, drives four steel stakes at the boat's corners into the lake bottom to hold steady, and shoots away.

Mr. Briggs owns six minicams, a 2¼x2¼ single lens reflex and four 16mm movie cameras. One of his greatest achievements is a color movie of flamingoes on Inagua Island near Cuba. Altogether he has snapped some 50 different species of water birds, but his only failure was the Bird of Paradise on Tobago Island. "The little nuts just wouldn't stand still long enough," he explains. •

Part of Briggs' armament showing some of his big guns. One movie camera, arrow, is a twin-lens reflex model for quick focusing.



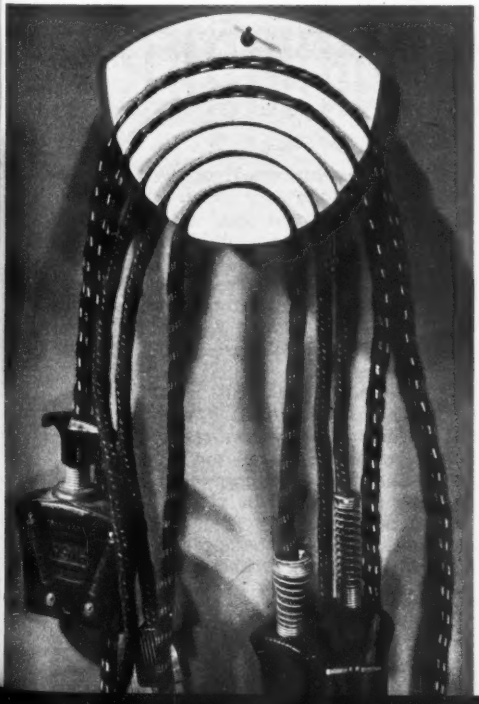
Live Lobsters. two in each can, are shipped anywhere in the United States. Caught in New England waters, the lobsters are hermetically sealed. Orders taken week in advance. Live-Pak, Boston, Mass.



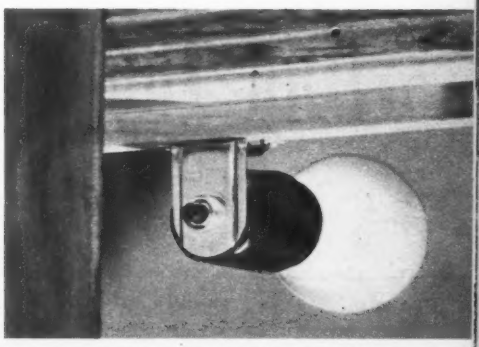
Unclog Drains with Trubl-Shooter. Gadget is used in manner of plumber's snake and is of sufficient length to open up 80% of stoppages. Crank turns shaft in pipe. California Moulders, Los Angeles.

NEW for the HOME

Appliance Cord Hanger of china pottery is approximately five inches in diameter. Five cords are suspended from grooves in hanger where they can't break or kink. McKinney, Los Angeles, Calif.



Snapit Door Lite goes out automatically when door is closed. It is molded of Bakelite, takes an ordinary bulb and has nine feet of cord to reach the nearest wall outlet. Cable Elec. Prods., Providence, R. I.



COVER STORY

Your Home in Miniature

With this kit, you can assemble, decorate, and furnish a midget version of your dream domicile.

TALK to a man who's built his home recently and sooner or later he'll say: "Now, if I had to do it over again . . ."

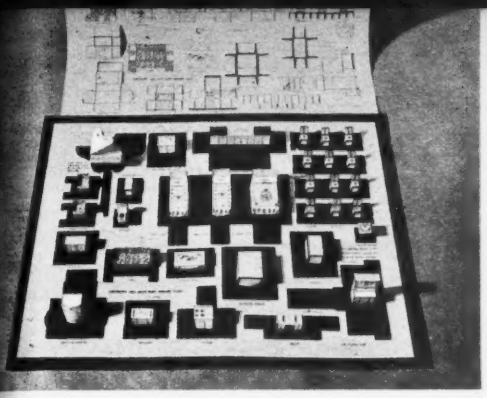
He discovers after moving in that the closets are too small, or the dining area takes too much space out of the living room, or the kitchen is inefficiently laid out, or twin beds won't fit into the spare bedroom. In fact, chances are he's found scores of undesirable features that he didn't notice when he okayed the architect's final blueprints.

The trouble is that the average man (and of course his wife) cannot visualize a three-dimensional house from a two-dimensional blueprint. And once the house is built, changes are prohibitively costly.

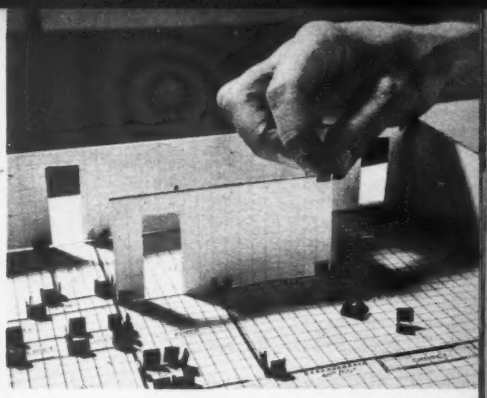
Hoyt Rust, a retired Denver engineer, has come to the rescue of prospective home-builders with a simple, inexpensive kit that enables anyone to make an accurate, sturdy cardboard model of his dream house.

"Such a model," Mr. Rust says, "lets you see the house exactly as it will be when built. You can spot planning errors before they're made. You can move partitions, change the location of doors and windows, make all the alterations you want before construction is started. You can even experiment with your own plans."

The kit includes [*Continued on page* 135]

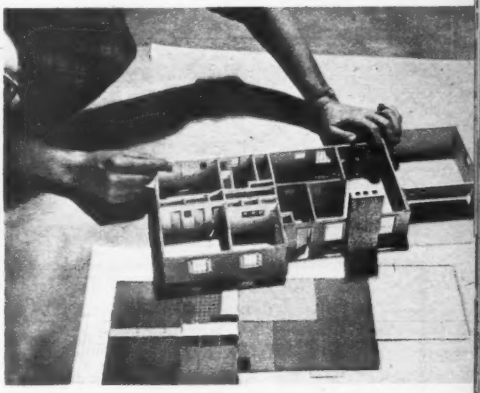


At top of above photo is the sheet of die-cut paper furniture that comes with kit. Below it, each piece has been cut out and put together.

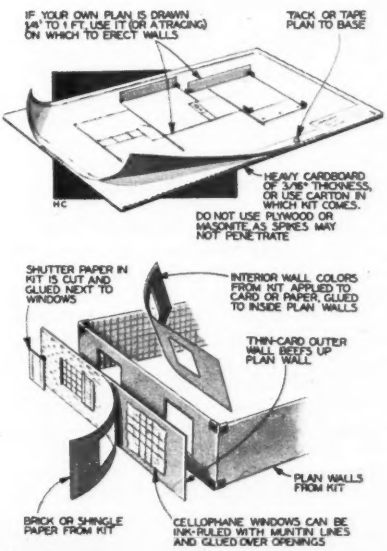


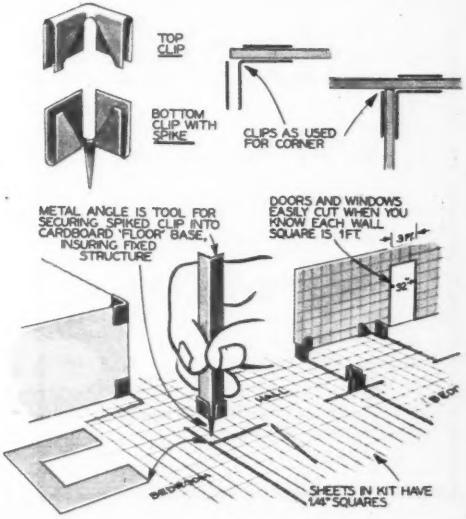
Metal clips are pushed into floor plan at all corners. Walls are held upright by these clips. Additional clips hold walls together at ceiling.

Hoyt Rust, inventor of kit, uses a razor blade in a holder to cut out a door on a scale model. In the background are several completed models.



Here, walls have been lifted off floor plan to demonstrate how model adds third dimension to an architect's flat, two-dimensional drawing.





Photos by Daniel R. Rubin

WALLS AND SIDING

Modern materials and methods make wailing walls unnecessary in your up-to-date home.

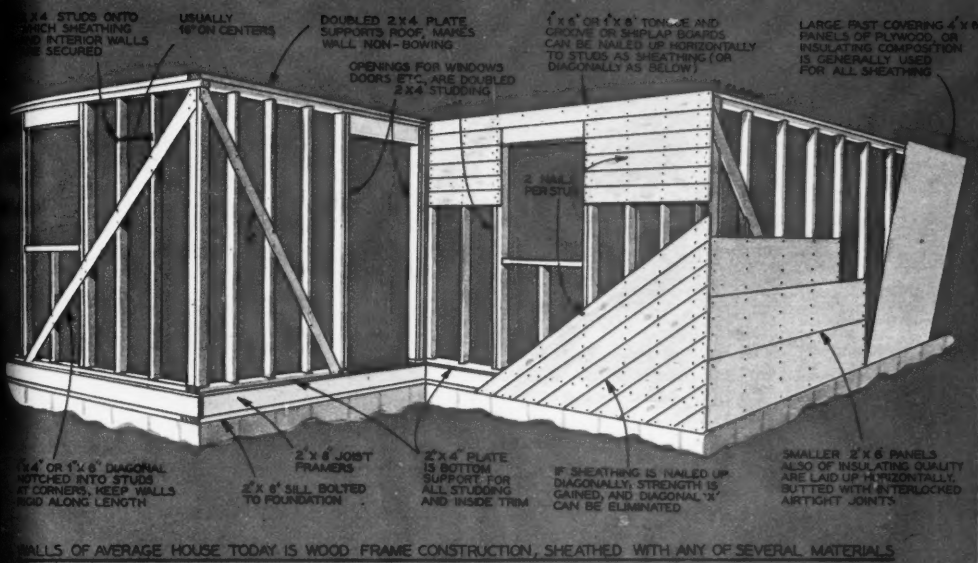
By Don Reiman

Sanders, Malsin & Reiman, Architects

THE basic function of a wall is to help shelter us from the elements. This function has not changed greatly since early times, but as our civilization and standards changed, new materials and skills developed to meet more complex demands. Earliest man constructed his shelter of mud, straw, or hides, and the design of his wall was based on the climate in which he was situated, the materials available, and the skills and tools at hand.

Today we are trying to solve the same problem using the materials and skills available to us. Production line methods and new manufacturing techniques involving prefabrication of wall panels, insulating materials, and framing members have had a marked influence on our construction and wall types. Although the wooden stud wall and masonry block or stone wall types prevail today, the newer methods are taking hold because of savings in labor and materials effected by their use.

The exterior wall, no matter what its construction, must satisfy certain requirements: (1) It must be designed to stand up under roof and wind loads. (2) It must be wind and waterproof. (3) It must be a heat barrier (minimizing loss from within and gain from without) and must be designed to prevent the condensation of moisture on its surface or within the wall itself. (4) Its interior finish must meet the



demands of occupancy (light reflection, sound absorption, waterproof qualities, etc.). I would like to discuss these four points as they apply to some of the wall types in use today. Let's start with the stud wall, as many of the principles for this type apply to others as well.

Stud Wall: The structural framework is made of 2x4 wood verticals or studs which are spiked to a wood sill and plate, each usually two layers of 2x4's, with 8-penny spikes. The sill is in turn bolted to the foundation wall below. Bolts ½-in. in diameter are set in the wall or in the cores of the block at 8-ft. centers. The studs are usually spaced 16 in. on centers to receive various interior and exterior wallboards which are 4 ft. wide (or a multiple of 16 in.). Each stud carries a small part of the superimposed load.

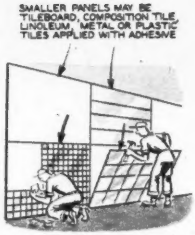
The entire assembly may be spiked together while flat on the floor, then raised into position and braced with temporary diagonal members until it is finally tied in. This framework is then sheathed with either boards (1x6 tongue and groove) or a panel material such as plywood or composition board, some of which double as insulating panels. The sheathing ties the whole assembly together, making a rigid unit of the wall and preventing it from buckling or racking. If the sheathing boards are put on horizontally, a 1x4 diagonal brace should be let into the studs at all corners and fastened with 10-penny nails.

Many new siding materials are available to make this wall impervious to wind and water. Most of these are nailed directly to the sheathing. The list is a long one.

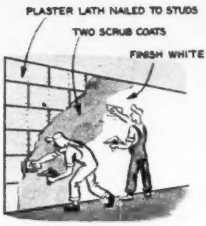
Vertical tongue and grooved redwood, cypress, or cedar, which may be blind-nailed to the sheathing and finished either with paint or with one of several wood preservatives, give a natural wood finish. A method requiring little maintenance is to use a bleaching agent which accelerates weathering of the cedar to a silvery grey. Wood clapboards may be finished similarly.

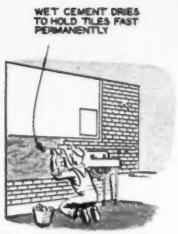
Wood shingles may be either painted, stained, or allowed to weather, the latter, of course, requiring little or no maintenance. The cement asbestos shingle comes in many colors and sizes, and its popularity is based on low cost and no maintenance.

Cement asbestos, either in flat or corrugated sheets, may be fastened with special nails to the framing and the joints covered with battens of wood or of the same material. In the case of the corrugated, the joints may be butted over a framing member and calked. These surfaces may be painted or not, as desired. The corrugated material is about ⅜ in. thick and is quite heavy and generally difficult to handle. It requires a special saw for cutting. It is generally used in industrial work although

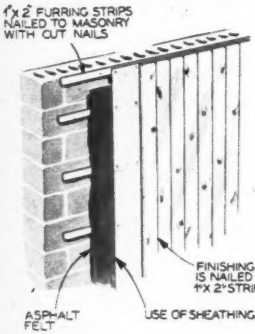


'DRY' WALLS ARE NAILED UP IN SHEETS OR SMALL SECTIONS

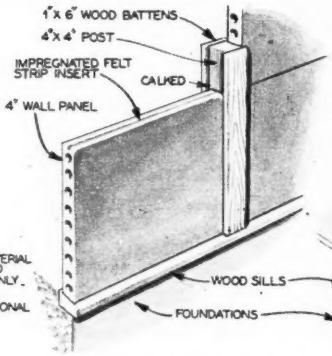




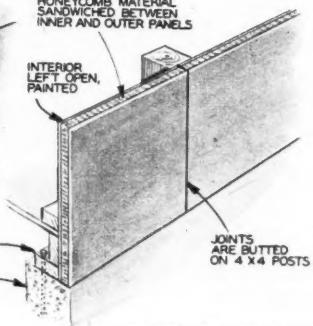
'WET' WALLS ARE MAINLY THREE COAT PLASTER OR CERAMIC TILE



MASONRY WALLS MAY BE FINISHED INSIDE OR OUT BY USE OF ANY BOARDS OR PANELS USING METHOD SHOWN.

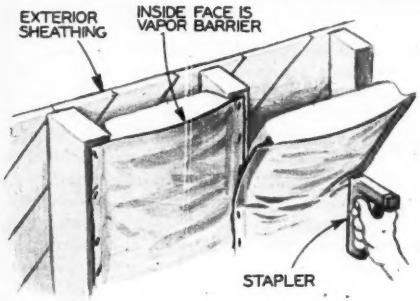


ONE NEW WALL SYSTEM USES PANELS SET BETWEEN WIDELY SPACED POSTS

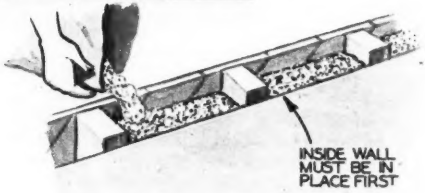


ANOTHER 'ONE PANEL' WALL UNIT FEATURES CORE OF CELLS FOR ADVANCED INSULATION

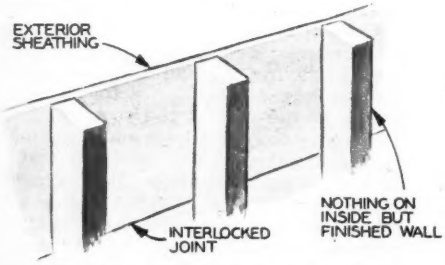
MATERIALS USED FOR INSULATING WALLS BETWEEN INSIDE AND OUTSIDE SURFACES



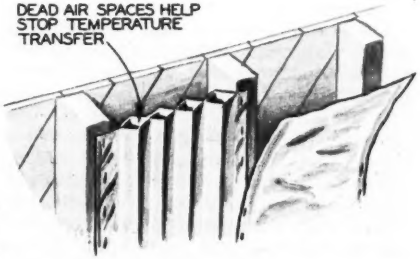
MINERAL WOOL BATTS OR BLANKETS STAPLED BETWEEN STUDS – 1" TO 4" THICK



MINERAL OR PELLET FILL IS POURED INTO SPACE BETWEEN STUDS AND BOTH WALLS



SOME PANELS ARE BUILT FOR DOUBLE DUTY OF INSULATING AND SHEATHING OUTER WALL



METAL FOIL, FOLDED OR FLAT, IS STAPLED TO STUDS – DEFLECTS HEAT OR COLD

it has been used successfully in houses.

Plywood: Be sure to use a waterproof plywood for exterior use. This may be applied with nails (aluminum or galvanized to prevent rust) every 6 in. around the perimeter of the panel and at 12-in. intervals on intermediate studs. The most common stock panel size is 4x8 ft., although others are available. Several joint types may be used in order to keep the weather out. If local codes permit, 3/8-in. plywood may be used alone in place of siding and sheathing. When plywood is used in this manner, you take advantage of all of its structural and weather-resistant qualities.

Metal: Many types are available in corrugated sheets, simulated clapboards and even shingles, and are easy to apply and require no maintenance.

Stucco is applied over metal lath secured to the sheathing. The greatest danger in using stucco over wood frame is that movement in the wood as it dries and shrinks tends to produce cracks in the stucco.

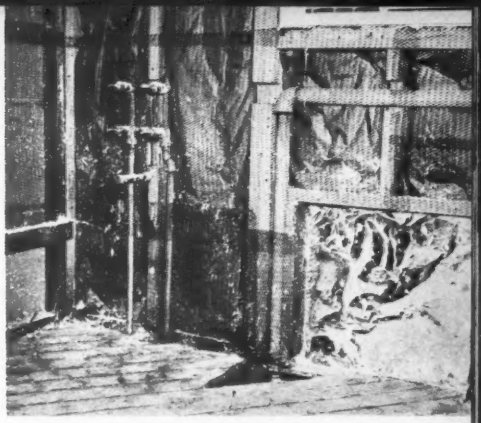
Brick: A 4-in. layer of brick is held about 1 in. away from the sheathing with galvanized iron clips. Building paper should be used over the sheathing and weep holes introduced at the bottom of the wall in order to allow any moisture, either from condensation or weather, to drain out.

There are hundreds of interior finishes available and the choice of a finish must be determined by the type of abuse it will be subjected to—scratching, water, heat, dirt—as well as to the appearance you may desire. A good finish, therefore, is one which will take the abuse with the least amount of maintenance and which will still give you the proper appearance. In general, there are two types, "dry" and "wet." The "dry" includes such sheet materials as Sheetrock, plywood, Celotex, Homasote, plasterboard, and metal tile (applied with mastic), rubber, vinyl, etc. The "wet" category includes plaster, ceramic tile, etc.

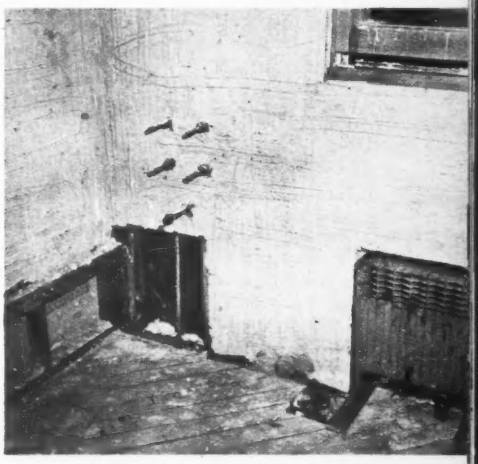
Masonry Walls of block, brick, stone, or concrete may employ any of the finishes described for the stud wall by furring out with 1x2-in. wood strips applied with cut nails and spaced to receive the interior or exterior finish. The furring gives you a space in which to place insulating material. Block walls may be sheathed on the inside or the outside, depending on the finishes desired.

The exterior surface of the masonry may also be treated with a waterproofing agent —cement paints or silicon-base compounds are available in either clear or colored form which will effectively waterproof the wall.

"Packaged" Walls: Many wall panels and framing systems endeavor to solve the

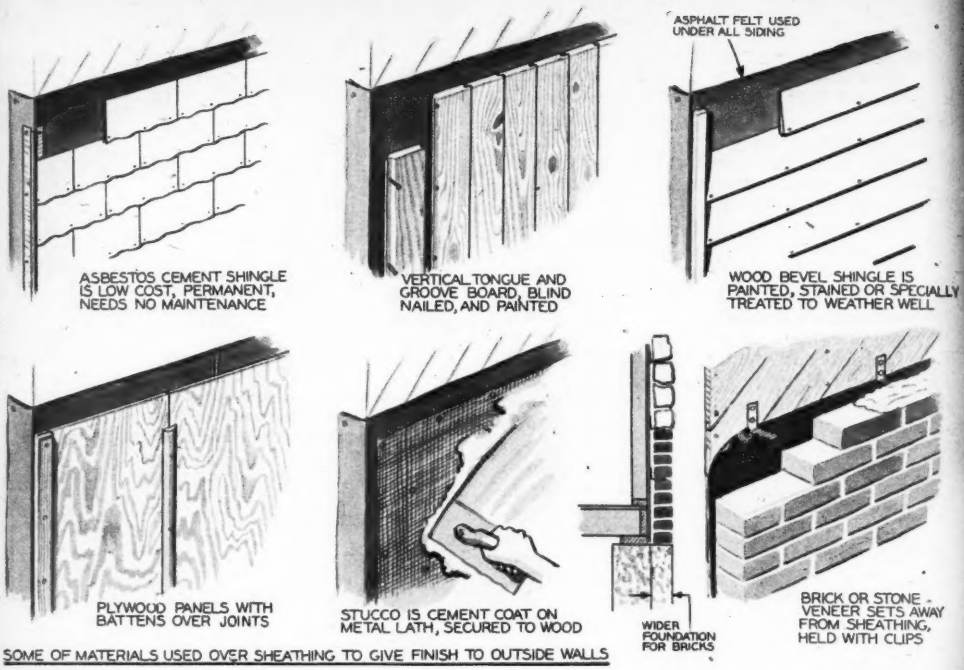


The evolution of an interior wall: at this stage the studs, insulation batts, and metal lath are all clearly visible. Note diagonal sub-flooring.



Primary plaster coat, which is applied directly to the metal lath, is roughly scored before drying so that subsequent coats will adhere well.

Tileboard panels comprise the actual interior wall. These are available in standard 4x8-ft. sizes, and may be had in a great variety of colors.



SOME OF MATERIALS USED OVER SHEATHING TO GIVE FINISH TO OUTSIDE WALLS

requisites for a wall in one "package." Basically, they consist of two skins bonded to either side of an insulating core. The panel may consist of a layer of cement asbestos bonded to either side of a laminated cane fibre core as in Cemesto board, in which case the bonding agent doubles as a vapor barrier; it may consist of a core of chemically mineralized wood chips sheathed with a cement coating as in the Durisol panel, or it may have a metal "skin" as in the Fenestra panel.

Since these panels are rigid and do the complete job except for structural support, you may space your studs farther apart to receive the panels. In so doing, increase the size to 4x4. The spacing, of course, depends on which type of panel is used and whether it is placed over the framing or between framing members.

Metal framing, in combination with different panels, is also used in house construction. The Unistrut system employs steel members designed to receive surfacing and insulating panels independently and combine them into a wall panel. The framework is bolted together in Erector Set fashion and may be dismantled. •

Sheathing is attached to studs, and in most cases will be covered by vapor barrier, then by the exterior finish, which may be of brick, wood, etc.

Brick veneer in this instance is applied directly over sheathing. L-brackets are attached to studs to anchor bricks, as shown in above sketch.

Insulate and Save

You can cut your fuel bills in half if you insulate your home.

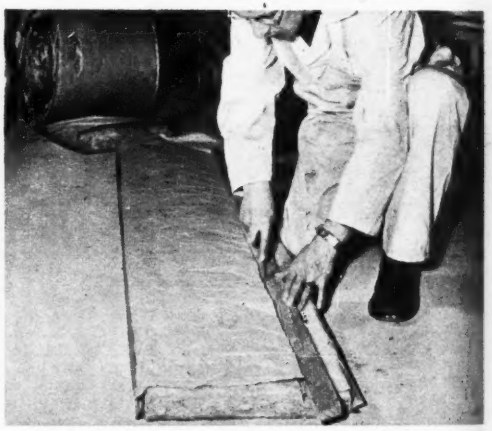
GONE are the days when the average home owner broiled in his dwelling during hot summer months and led an icebox existence in the winter. Thanks to the wide use of insulation and the education of the average home owner to the importance of having an insulated dwelling, greater summer and winter comfort and a

Vermiculite loose-fill insulation pours from bag like popcorn, flows snugly around obstructions, and is leveled 3 in. deep with a cardboard rake.

Fiberglas batts, 5 in. thick, fit neatly between attic floor joists to prevent heat from escaping upward out of the living quarters below attic.

Blanket insulation for side walls should be cut slightly long so it can be run below the floor line and so it can be secured at top and bottom.

To insulate narrow space between studs, measure width, add an inch, and cut blanket. Slightly compress filler. Facing forms nailing flange.



healthy saving in fuel bills are now possible. However, even more education is needed. Many people still do not know what they are missing by failing to insulate their homes. It is not an expense to insulate; it is an investment.

The best insulation in the world is just plain air. It is effective as an insulator, however, only when it is pinned down. Many people still believe that the hollow spaces in their exterior walls are filled with insulating "dead air." This is not true. Actually, the air in hollow walls is circulating constantly.

The basic job of insulating materials is to slow the flow of heat through the walls, floors, and roof of your house. Two types of insulation provide effective resistance to heat. One utilizes air spaces to retard heat flow; the other depends upon exposed shiny surfaces to reflect the heat. The first type—often referred to as mass insulation—comes in such forms as batts, rolls, pellets, and granules. It is produced from processed stone, slag, mica, glass, wood, cotton, sugar cane, and other materials. The second type comes in sheets or rolls. It is made of metal foil, sheet metal, metallic paints, or aluminum-coated paper.

Whether you plan to install your own insulation or are considering having someone else do it, you will find a wide variety available. Your choice should be governed by such factors as the cost of the material: its effectiveness, durability, and fire resistance; the kind of service it will give in those

Vapor barrier on nailing-flange side of blanket insulation should always face inside of room. Secure flanges with nails, tacks, or staples.

As shown here, utility batts—pads of fluffed insulating material—can be laid between joists in attic floors. Press batts closely together.

Insulating blankets being attached to ceiling joists. Both blankets and batts generally come in thicknesses of one, two, and three inches.

Reflective insulation, made of metal foil, sheet metal, metallic paints, or aluminum-coated paper, is efficient because of ability to reflect heat.

areas that you feel should be insulated; and the ease and cost of application.

Flexible, reflective, rigid, and loose-fill insulations all serve their particular purposes well. For persons who install their own, loose-fill and flexible types seem to be popular because they are easy to purchase at the retail level and are easy to install.

Loose-fill insulation comes in bags. It can be poured, blown, or packed into those areas needing insulation. The spaces between the joists in your attic floor are particularly adaptable to this kind of insulation.

Flexible insulations, which include blankets and batts, are sized to fit between studs, joists, and rafters. They are easy to install because they are light in weight and require little cutting and fitting. They usually have paper facings that act as vapor barriers. The facings extend beyond the blankets or batts to serve as flanges so the insulation can be nailed, tacked, or stapled in place between the wooden framing members. Blankets are sold in rolls up to 100 feet long. Batts are shorter than blankets. Both usually come in thicknesses of one, two, and three inches.

Rigid insulations include building board, sheathing, lath, tileboard, planking, and roof-insulating board. Most of these are applied over such structural members as wall studs, floor or ceiling joists, and rafters. Celotex building board, used for quick, low-cost conversion of attics,

As much as ten per cent of your heat can be lost through crawl spaces (those open areas under the house); so install insulation between the joists.

Be sure to insulate all crevices and irregular spaces. Note that installer has cut a piece of vapor barrier to place over the insulation here.

Attic should be ventilated so water vapor can be carried off. Here, section of siding is being sawed for removal to allow addition of a louver.

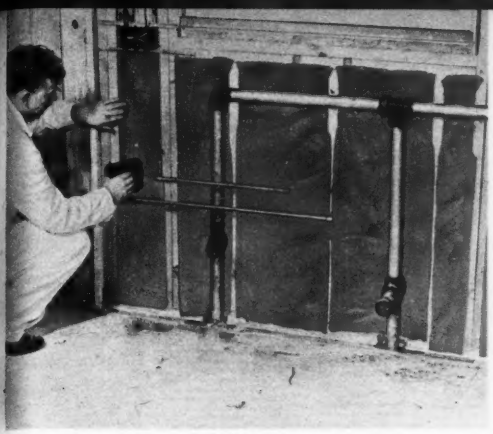
Ventilating louver being installed. About one square foot of opening should be furnished for each 250 sq. ft. of insulated attic floor space.

porches, and basements into living and recreation quarters, is an example of the rigid type. Another example is Fiberglas ceiling board, which is employed extensively in ceiling areas. Besides serving as insulation, it provides a decorative appearance.

As an example of the investment value of insulation, a Toledo home owner purchased 32 bags of loose-fill insulation for $45. This was enough material to insulate to a depth of three inches between the joists of his attic floor, which had an area of 660 sq. ft. He completed the job himself in the summer of 1950. His fuel saving during the following two winters amounted to two tons of coal, or nearly $40; so the insulation will have more than paid for itself by the end of this winter.

In general, it can safely be said that—depending upon the type of construction used in a dwelling and the kind, amount, and location of the insulation—fuel consumption can be reduced from 20 to 50 per cent by insulating.

In one locality, a 40-lb. bag of loose-fill insulation—enough to cover about 22 sq. ft. to a depth of three inches—can be purchased for about $1.50; a container of paper-faced insulating batts, which provide coverage for about 50 sq. ft., can be bought for $3.49; and a container of another make of batts—enough to cover about 30 sq. ft.—is priced at $2.15. Each of these examples boils down to about seven cents per square foot. In other sections of the country, the same insulation may cost

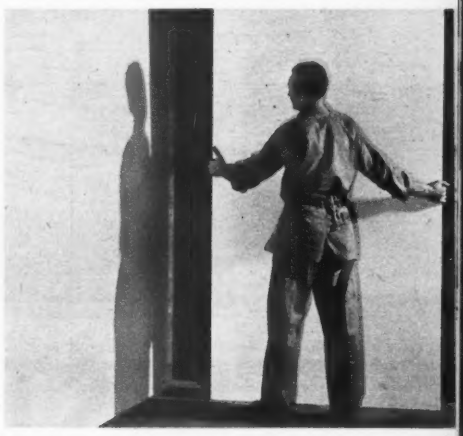


Protect plumbing against freezing by insulating behind all water lines and drains. Shown here are blankets pressed between plumbing and wall.

Side walls of this prefabricated home contain insulating batts. Batts and roll blankets can be used in either new construction or old homes.

Perimeter insulation around foundation of home with no basement keeps out dampness and cold. Fiberglas asphalt-enclosed board is used here.

Celotex building board, a rigid-type insulating material, can be used nicely for quick, low-cost conversion of attics, porches, and basements.



Photos courtesy Celotex Corp., Owens-Corning Fiberglas Corp., and Zonolite Co.

a bit more or less. It is important to remember that prices depend upon where you live, the season of purchase, the law of supply and demand, and the dealer from whom you buy. If you know how many square feet must be covered and the kind of insulation you wish to use, you can obtain the approximate cost from your hardware or building-materials dealer. He will give you current prices prevailing in your locality.

Once you decide to insulate one or more areas of your home, you will find this is the easiest way to figure the amount of insulation you need: multiply the length of the area to be insulated by its width, subtract the square footage of any openings, and divide the result by the number of square feet that one bag or container of insulation will cover. The final figure will be the number of bags or containers you will need.

For example, suppose you plan to insulate a 10x20-ft. wall. By multiplying length by width, you get 200 sq. ft. Let's assume that the area has a 4x6-ft. window opening. In square feet, that measures 24. Subtract 24 from 200, which leaves 176 square feet to be insulated. If one bag of loose-fill insulation covers 20 sq. ft. to a satisfactory depth, then divide 176 by 20. The resulting figure is 8.8, which is the number of bags you need to do an efficient job. You will be wise, however, to buy ten bags to give yourself a margin of 1.2 bags.

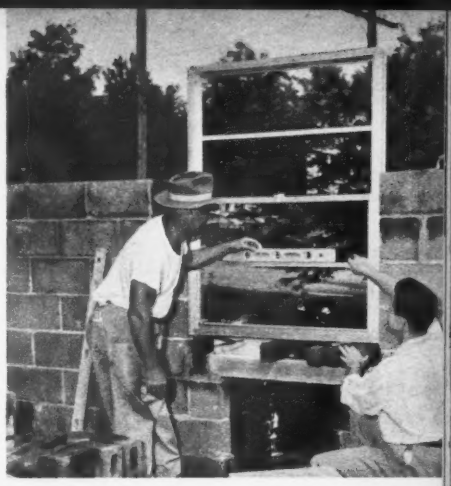
In theory, it is impossible to use too much thickness of [*Continued on page* 134]

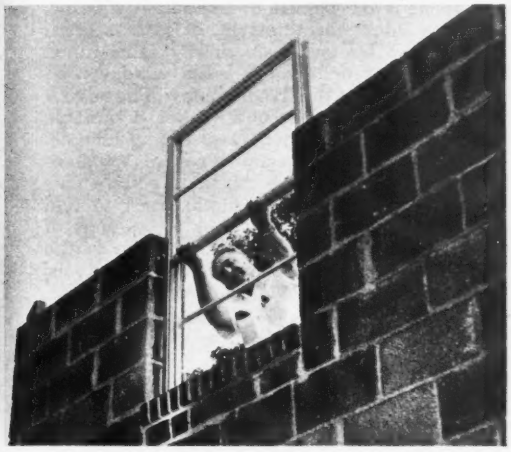
FENESTRATION

You're beginning to see the light if you include ample, well-proportioned windows when you build your new home.

By M. J. Bratton

THE windows in your twentieth century home have undergone many changes since the Egyptians decided, in about 5,000 B.C., to cut simple openings into their walls. In fact, the word window literally means "wind eye"—an aperture through which the breezes can enter freely. The design for the common double-hung window which slides up and down within a fixed frame was created in the 1700's. Further basic improvements have been instituted only recently. Today new types of sash, glass, weatherstripping, better methods of closing, and scientific insula-





Top: The double-hung window is still the most common variety. Picture window at the far left is flanked by this type to assure ample ventilation.

Top: Be sure that windows are level and plumb. Today's precision-made units—in this case aluminum—serve best only when properly installed.

It is important that the window sash be locked in the frame securely during installation. Note that sash has been taped to prevent any movement.

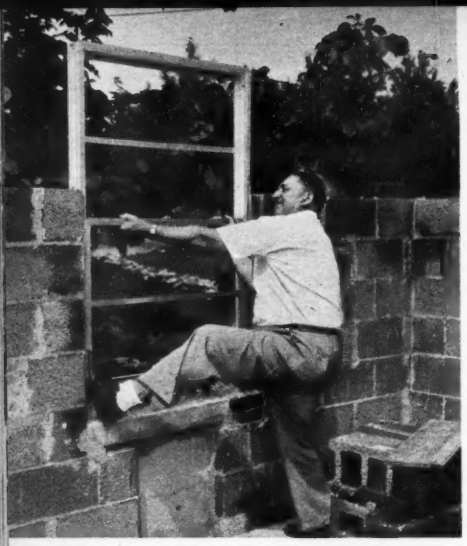
Never use a window as a sawhorse or to support a scaffold. Such thoughtlessness can easily affect the smooth and easy operation of the sash.

tion are contributing to greatly improved designs in this important construction feature. Let's consider the basic types being used in contemporary homes, sash materials, installation procedure, and maintenance.

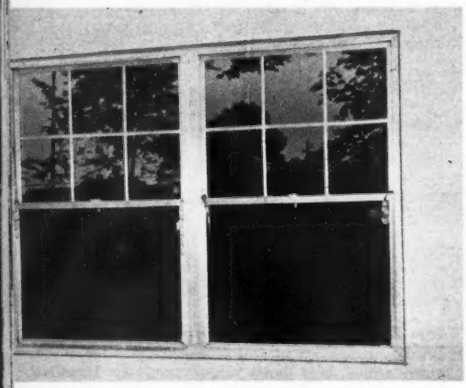
The basic types of windows are double-hung, casement, fixed, projected, awning, sliding and jalousies. Almost all of these types are available with aluminum, steel or wood sash. Bronze or stainless steel sash is beyond reasonable cost for most home installations, as they are not fabricated on a mass-production basis.

The double-hung sash is divided into an upper and lower section, each section sliding up and down past the other. It lends itself to weather-tightness and efficient operation. Casement windows are hinged to the frame at either side and swing in or out to provide 100 per cent ventilation—that is, the entire window area can be opened if desired.

Some windows incorporate summer screens and winter sash, with the result that these seasonal additions never have to be removed and stored. Rainproof filtered screen ventilation may be employed at any



Your window, whether it be of wood or metal, should be fixed in its position firmly and securely. A couple of hefty heaves shouldn't budge it.



Before proceding to interior plastering, stuff some rags between sliding members of the sash and frame to prevent the possibility of clogging.

Alwintite horizontal sliding unit may be used singly or combined with other types. Note height of this installation and weep holes in tracks.

time, regardless of the weather. Glass and screen inserts are easily removed from the inside for cleaning and eliminate the danger of falling and breakage. These units are usually called combination windows.

The sliding sash is one of the newer members of the window family. The sections move horizontally past one another. It is in reality a double-hung window placed on its side. Awning sash, which first became popular in the South, has been gaining rapid acceptance throughout the nation. Since all awning sash swings out at the bottom, it sheds water away from a building and also produces 100 per cent ventilation when fully opened.

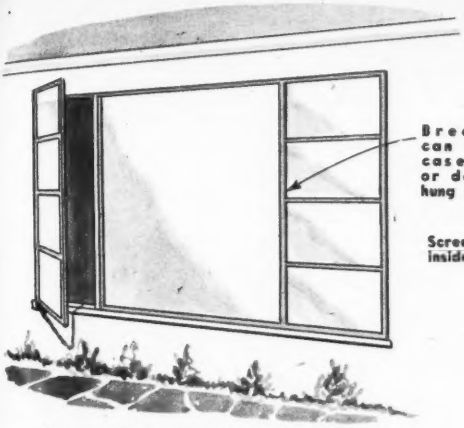
One of the most popular windows nowadays is the picture or fixed sash window. Ventilation for this type of sash is often handled by using standard double-hung, casement, or awning sash windows on either side of the fixed window. The advent of insulating glass now makes it possible to use double-paned glass in any climate.

Many other special types of windows exist today, such as the folding sash. This operates along a horizontal track to fold neatly against its neighbor at one side of the window frame. Another type is the window which works on central swivels, allowing easy cleaning from the inside. One of the most startling innovations in the window field is the jalousie. Its slender glass sections turn like venetian blind slats.

If either retaining heat or keeping it out is your problem, storm windows or double glazing (two panes of glass with an air space between them) is the answer.

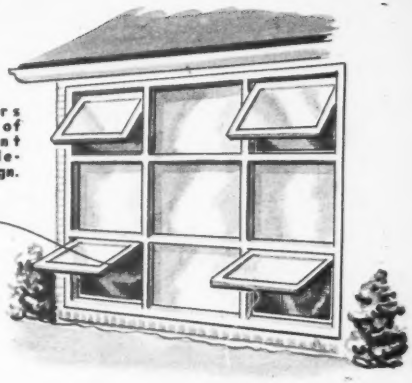
Proper sash selection is important. Wood sash falls into three basic types: true pine, Ponderosa pine and durable woods. Under the true pine category, which is highly recommended for sash, is the northern and eastern white pine, Idaho pine and sugar pine. Ponderosa pine in its natural state is not normally considered as good for sash as the true pines. However, thanks to the commercial treatment of wood preservatives, Ponderosa pine is now in the same class as the true pines. Simply ask your dealer if his Ponderosa pine is eligible to bear the approved seal of the Ponderosa Pine Association. This seal assures you that you are receiving a top-grade wood sash.

In the durable woods classification we find red cedar, cypress and redwood. These woods are particularly durable, particularly under high moisture conditions. The cost is somewhat more than the other woods. Price differential between true pines and Ponderosa pines will vary, de-



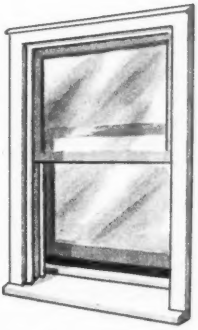
Breezers can be of casement or double-hung design.

Screens inside

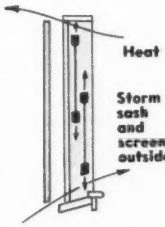


Picture window is wood or metal, usually air and temperature proof. Can be opened to breezes by means of small end windows.

Window wall is comprised of wood frames with double glass in each frame for insulation. Two or more hinge open.

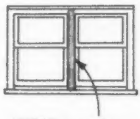


Double-hung unit is either wood or metal, consists of two glass panes that may be raised or lowered in frame.

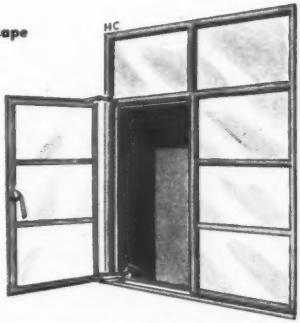


Heat escape

Storm sash and screens outside

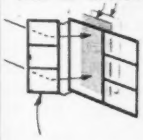


With center mullion two or more windows can be joined

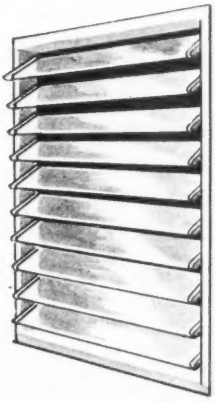


Casement is all-metal frame with two or more sections opening out to catch breeze.

Screen or storm sash fit inside



Even a single section can be aimed to catch breezes from any direction

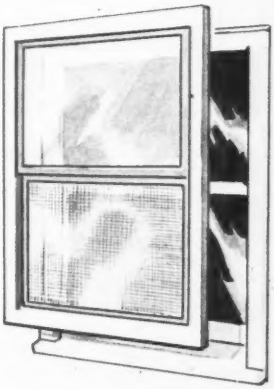


Jalousie window is a series of narrow slats of glass pivoted at ends to tilt open or closed.

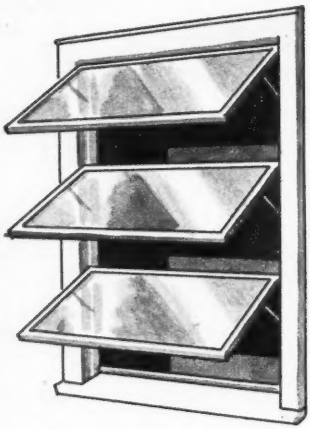
Air and water-tight when sash is fully closed

Slats may be tilted to any angle—sheds rain.

Screen or glass panels are stored out of way.

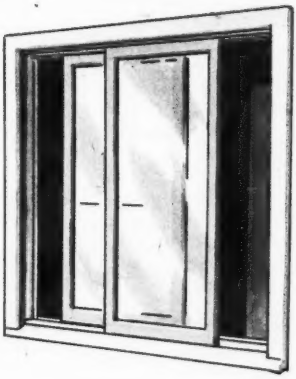


Combination storm sash and screen unit is placed into double-hung window, saves trouble of seasonal removal.



Awning or projected panels of metal or wood allow maximum entry of air currents.

Full ventilation even during a mild rainfall



Sliding panels are two or more glass frames slid open or closed in a track on the sill or on overhead rails.

pending on the section of the nation in which the wood is produced. All woods must be completely knot-free in order to be used for sashes.

In steel sashes, quality can be determined by asking your dealer or builder if the steel windows conform to the recommendations of the American Standard Association Project sponsored by the American Insitute of Architects and the producer's council. Windows are tested for strength of section, sound construction, quality materials and low air infiltration.

Installation is a problem of great importance to home owners. The first rule of thumb is to acquire manufacturer's instructions. All reputable manufacturers provide complete installation details. Your local building merchant should be able to aid you in the application of the instructions to a specific problem. Ask him for information from Metal Window Institute, National Wood Work Association, or the Aluminum Window Manufacturers Association, depending on which of these materials has been employed in the construction of your windows.

Certain factors must be observed in the case of all windows. The following pointers will prevent future trouble.

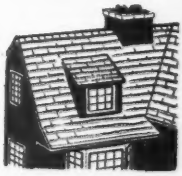
When unloading windows, be sure (1) to stack vertically. Do not pile one on another. (2) Do not remove any protective covering. (3) Keep windows off the ground. (4) Store hardware separately. (5) Leave attached any wires or clips that hold the ventilator closed.

Installation procedure: (1) The prepared opening must be made to meet details. (2) Check opening thoroughly to be sure it meets manufacturer's details. (3) Apply a good field coat of paint to wood or steel before setting in a prepared opening. Since aluminum windows never require painting, this operation is unnecessary for them. (4) Install your windows plumb and level. (5) Do not use muntins and rails for cleaning trowels, supporting scaffolding, or as ladders. (6) Sashes should be locked firmly in a closed position during installation. (7) Leave manufacturer's and dealer's instructions attached to window until glazing. (8) Anchor the frames in strict accordance with the manufacturer's instructions. (9) Do not close up the holes provided in the frame for screws and seal sash well with mortar, plaster or interior trims. (10) Remove wet plaster, mortar or cement before it sets. This will save money, simplify cleaning and assure a good job. (11) Be sure to use putty or glazing compound that is meant specifically for wood or steel. If a good mastic type meant especially for aluminum windows is not used, you will lose the basic value of the aluminum—the fact that it does not have to be painted. (12) Sash must be square and muntins properly aligned before glazing. (13) All surfaces should be cleaned of dust, dirt, paint or plaster to prevent fouling of weathering areas.

As far as maintenance is concerned, the operating cost of steel or wood windows can be held at a minimum if you paint them every three years. •

The Roof Over Your Head

No other part of a house has more effect on its appearance than the roof; so be sure to choose the type best suited to the style of your home.



By John Hancock Callender, Architect

THE purpose of a roof, of course, is simply to keep the rain and snow from coming into the house. Important as this function is, it usually plays very little part in determining the type of roof to be used. No other part of a house so greatly affects the appearance of the entire house as does the roof. The style, character, and degree of attractiveness of the house are largely the result of the design of the roof. For this reason, the type of roof used on a house is almost always determined by considerations of appearance rather than function. Since this is so, it seems well to discuss the different types of roofs and their appearance before going into matters of construction and materials.

The four types of roofs in general use today, are *gable, hipped, shed,* and *flat.* By far the commonest is the gable roof, which is used on most traditional houses such as Colonial and Cape Cod. The gable roof slopes downward in two directions from a central ridge. The triangular wall areas formed at the ends of the house are the gables that give the roof its name. Traditional gable roofs were usually quite steep, forming sizable attics. The attic space was often used to provide extra rooms and in this case dormers were employed to supply light and ventilation to these attic rooms. Gable roofs are not necessarily steep, however. In the Greek Revival period and in modern houses, we often see gable roofs of

very little degree of slope or inclination.

A roof that slopes uniformly on all four sides is called a hipped roof. The sloping ridges formed where the roof planes intersect are called "hips" and give this type of roof its name. A hipped roof is much less conspicuous than a gable roof. Since the eave line is continuous around the house, the appearance of the house is very much the same whether seen from the front or side. Hipped roofs were used in the late Georgian period and in many French styles and have been increasingly popular in recent years for houses of contemporary style.

A roof that slopes in but one direction is called a shed roof. As its name implies, it has no aristocratic forebears. But the shed roof is extensively used in contemporary houses because of its simplicity and its ability to provide a higher ceiling in one part of a house than another.

The flat roof needs no definition other than to explain that it may be absolutely flat or it may be pitched slightly for drainage. If the slope is enough to be perceptible, it becomes a shed roof.

There seem to be many popular misconceptions about flat roofs. One is that only "modernistic" houses have flat roofs; another is that flat roofs can not shed rain nor support heavy snow loads. Neither of these ideas has the slightest foundation in fact. Flat roofs have been used in many of the traditional styles of the past. For example, during the Greek Revival period of the 1830s and later, thousands of flat-roofed houses were built all through New England, New York, and Ohio. These houses have been successfully shedding rains and supporting heavy snows for more than a century and they are still going strong.

Those who express doubts about the waterproofness of flat roofs and their ability to support snow apparently never think of the many familiar buildings other than houses that are flat-roofed: stores, schools, apartments, filling stations, etc. These buildings usually suffer less from roof leaks than does the conventional house with its pitched roof, and their flat roofs rarely collapse under the weight of snow.

Flat roofs are often said to be hot in the summer. If there is no insulation and no ventilation to remove the heated air immediately below the roof, any house will be hot in the summer. With adequate insulation and ventilation, the flat-roofed house will be just as comfortable as one with a sloping roof.

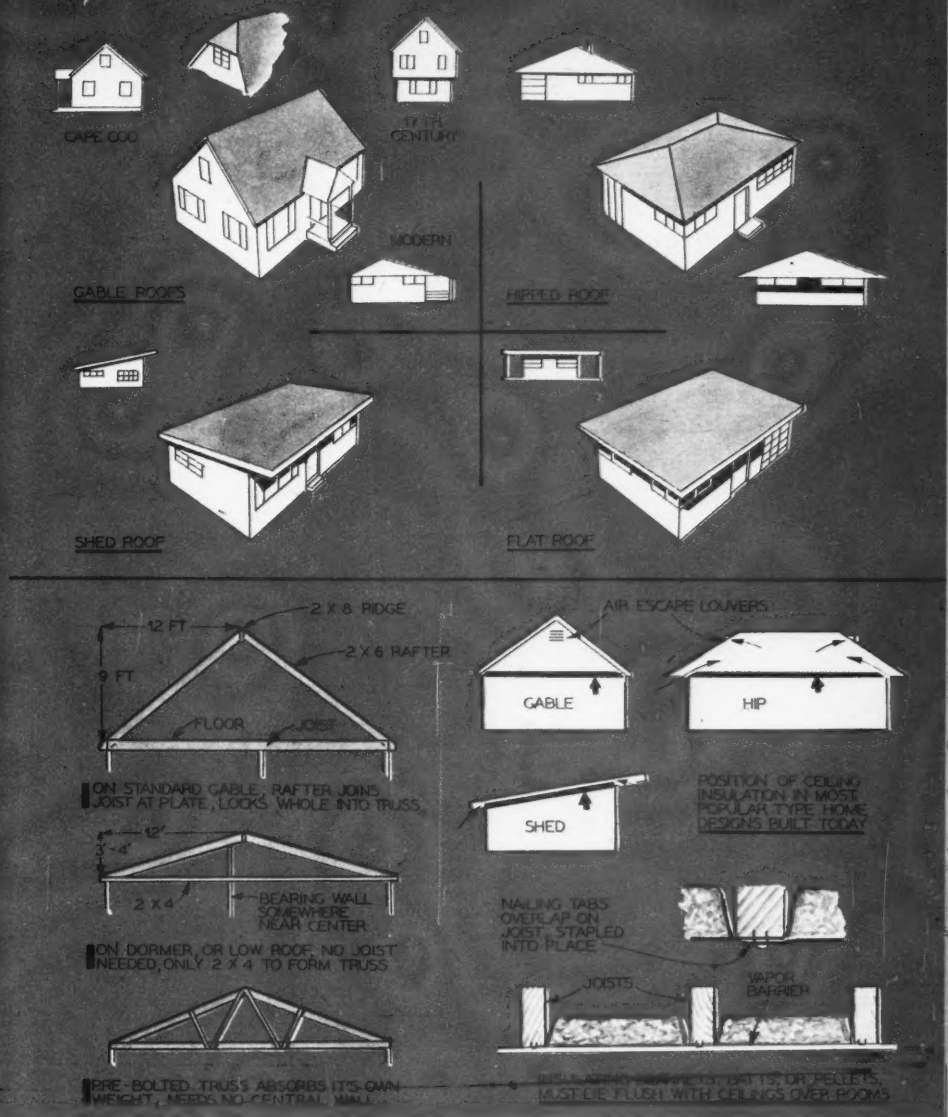
Another prevalent fallacy about flat roofs is that they are much cheaper than any other type of roof. A flat roof will certainly be cheaper than a pitched roof that is complicated by the introduction of hips, valleys, and dormers; but on a simple rectangular house, a flat roof may cost slightly more than a gable roof.

Many modern houses have flat roofs, but many more do not. When sloping roofs are used on modern houses, they are likely to be of very low pitch. The reason for this is that modern houses have big roof overhangs to protect the large glass walls from summer sun. A high-pitched roof with large overhangs is wasteful of material and makes the house look unpleasantly top heavy. Many of the "expansion attic" houses of recent years suffer from this top-heavy appearance.

From all of the above, it is apparent that there is much more involved in the design of the roof for your house than merely keeping the rain out.

Before going into construction details, it might be well to explain how the steepness of a roof slope is measured. The pitch is usually specified by the number of inches

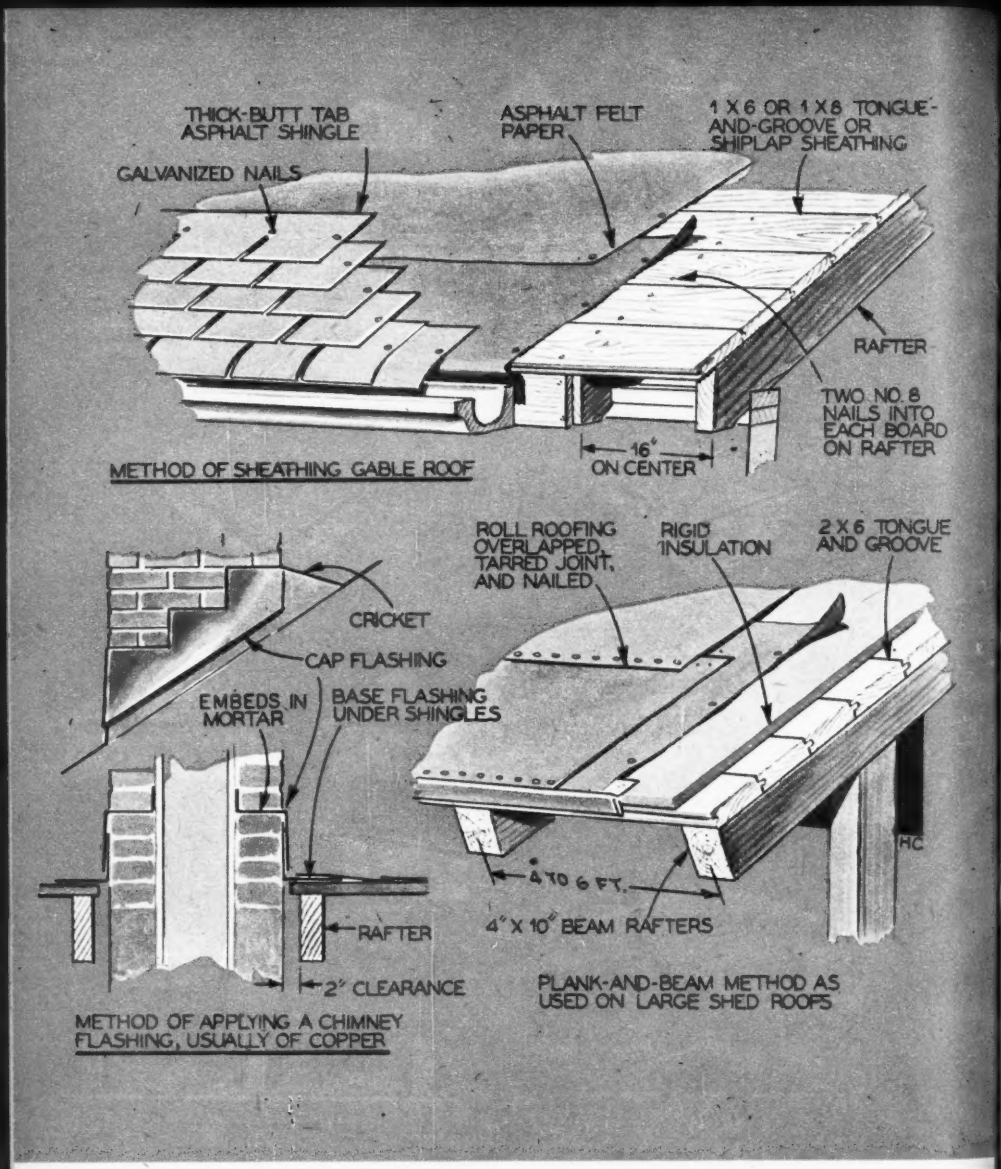
Flat roofs need not be hot in the summer. With adequate insulation and ventilation, they are just as comfortable as roofs that slope.



of vertical rise per 12 inches of horizontal run. Thus, a 5 in 12 (or 5:12 or 5/12) pitch is one which goes up 5 in. for every 12 in. it goes horizontally.

The sloping structural members that support the roof are called rafters. The size and spacing of the rafters will vary with the span, the species and grade of the lumber used, and the wind and snow load anticipated. Most construction handbooks have tables for the design of rafters and many local building codes have specific requirements on the subject. Rafters are notched over horizontal members called plates and are toe-nailed securely to them. In the average pitched roof, the ridge member does not support anything; it aligns and braces the rafters and gives them something to nail to. Rafters exert an outward thrust on the walls. This thrust is ordinarily taken by the ceiling joists, which should therefore be securely nailed to the rafters.

The triangle formed by two rafters tied together by a ceiling joist is really a simple



truss. This fact has been utilized by many builders of large-scale housing operations. Instead of cutting, notching, and nailing each rafter and joist in the field, they fabricate in a shop an engineered roof truss of light wood members. These trusses are then trucked to the site where they are erected very rapidly. This system permits the house to be enclosed speedily so that work can continue regardless of the weather. Since the roof trusses span from wall to wall, no bearing partitions are needed, and much of the mechanical and finishing work can be better done in the unobstructed space before the interior partitions are installed.

A gable roof with a pitch of less than 3 in 12 does not have enough truss action to span from wall to wall of the average house. It therefore usually receives intermediate support from a bearing partition or a girder, and is structurally similar to a flat roof.

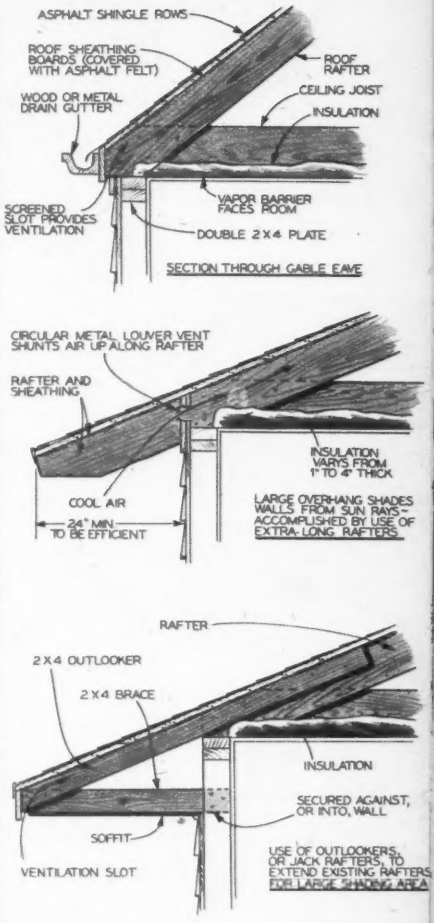
Low-pitched and flat roofs often employ

"plank-and-beam" construction. In this type of construction, large beams are used, spaced widely apart, and covered with a decking of 2-in. tongue-and-groove planks. A typical case might have 4x10-in. beams, 6 ft. apart, covered with 2x6-in. planks. The beams are exposed and the undersides of the planks form the finished ceiling. Rigid insulation and built-up roofing go on top of the planks.

The simplest way to get a roof overhang is to let the rafters extend out as far as desired. Sometimes, however, in order to avoid paying a premium for extra long rafters and to avoid handling such long pieces, it may be preferable to use "outlookers," which are light extensions nailed onto the sides of the rafters. If the overhang is to be enclosed at the bottom, light horizontal framing members will be required to support the finishing material, which may be waterproof plywood, tempered hardboard, or asbestos cement.

Adequate insulation and ventilation are essential for summer comfort and winter fuel economy. A blanket insulation with a vapor barrier is the type most often used. The insulation should be installed between ceiling joists (not roof rafters) with the vapor barrier on the lower side and should be installed before the ceiling finish is put on.

The attic or space above the insulation must be freely ventilated. Louvers in gables should be placed as high as possible in order to permit the escape of the hot air that accumulates at the ridge. A hipped roof is usually ventilated by extending the ridge at each end to form two small gables that contain louvers. Flat and shed roofs must depend for ventilation upon continuous slots at the [*Continued on page* 156]



The sizable attic formed by a gable roof can be finished off to provide extra bedrooms. Here, dormers are installed for light and ventilation.

Hipped roofs, familiar because of their use on many French and late Georgian homes, have been increasingly popular on contemporary residences.

YOUR FLOORS

For beautiful, long-lasting floors, install durable flooring materials over level, neatly made subfloors.

By E. C. Breeding

WOOD floors were once the only type used in houses regardless of the income brackets of the owners. The houses on the wrong side of the tracks usually had pine floors and the ones occupied by people keeping abreast of the Joneses were oak or maple.

Mass production soon brought the blessings of hardwood within the range of moderate budgets and almost every listing under "Houses for Sale" included hardwood floors as a salient sales feature. Hardwood is a warm, resilient floor that is easy to maintain and continues to look well after years of service.

Perhaps its supremacy would never have been shaken if the war had not forced many builders to take the substitute route by extensively using floorings that had previously been considered novelties. Because prized hardwood was going into war production and was not available for civilian use, materials that had been confined to the kitchen or bath were used throughout the house. Asphalt tile, rubber, cork, terrazzo, linoleum all came into their own. Many housewives decided they were willing to sacrifice the rich beauty of waxed oak for asphalt tile that could be dismissed with a flick of the wet mop and a coat of self-polishing wax. Others considered any flooring acceptable if it was to be hidden with wall-to-wall carpeting. The so-called substitutes proved especially popular for rental properties.

Which flooring is best? Which is the wisest choice for the man who wants to install his own flooring? Actually, no single flooring material is ideal for use throughout the house—the ideal floor would withstand dirt, moisture, and heavy use; it would retain its good looks with a minimum of care; and it would be durable. A floor that is beautiful and serviceable in the living room won't always withstand the grease and water spots it is subjected to in the kitchen.

Another important factor is the type of construction. A level wood subfloor is necessary for wood flooring on joists. The subfloor should be tightly nailed and laid in diagonal strips over the joists. Building paper should be placed between the subfloor and the finished flooring as protection against dirt and moisture. [*Turn page*]

Prefinished hardwood floors are easy to install. The examples shown here are Bruce's ranch planking (opposite page) and parquet blocks (above left).

Rubber tile is being laid here. It deadens noise, is warm and flexible underfoot, and is easily maintained with soap and water and a little wax.

The concrete slab in a basementless house is laid on a bed of cinders or gravel with membrane waterproofing to keep the moisture out. Resilient floorings or hardwood can be laid in mastic over this type of foundation.

Concrete is also used as the base for ceramic tile and terrazzo. In a frame house, floor boards are placed between beveled joists, waterproof felt is applied, and the concrete is poured. Next, the tile is laid in mortar or the terrazzo is spread over the concrete.

Plywood or hardwood on a wood subfloor is a suitable base for linoleum, cork, rubber, or plastic tile. Another type of subflooring is wood flooring on a concrete slab. The subfloor is laid diagonally over wood strips embedded in the slab.

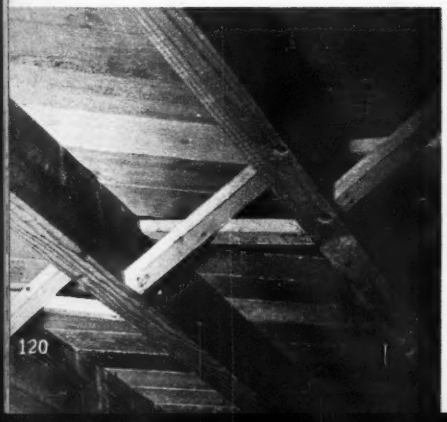
From the investment standpoint, hardwood is probably the best buy. Even the lowest grades make beautiful floors. Hardwood is durable and easy to maintain and with moderate care never needs refinishing. It is the favored flooring of 85 per cent of the home owners throughout the country. If subjected to extremely hard traffic and abuse, it can be refinished to its original beauty at a fraction of the cost of a new floor. It is available in narrow strips, wide planks, and blocks. Because it can be applied over old wood floors, wood subfloors, or concrete, it is equally suitable for new construction or remodeling.

Hardwood flooring can be obtained from the factory already sanded, finished, and waxed Remodelers like this because it keeps confusion at a minimum. Contractors for new construction like it because it saves hundreds of dollars and days of time by eliminating the muss of sanding and finishing. The factory finish is applied under controlled conditions and is not affected by the weather. [*Continued on page* 158]

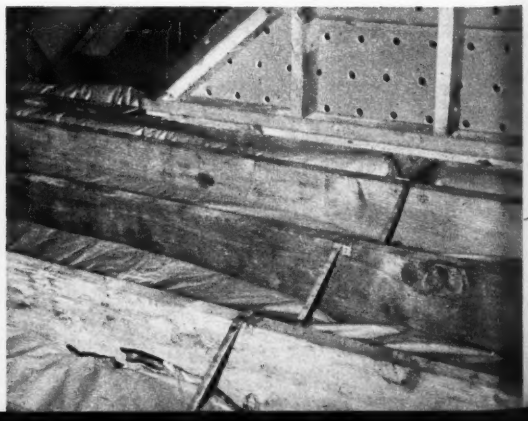
Parquet blocks can be laid either diagonally or parallel to a room's walls. If laid diagonally, the floor should be started as pictured above.

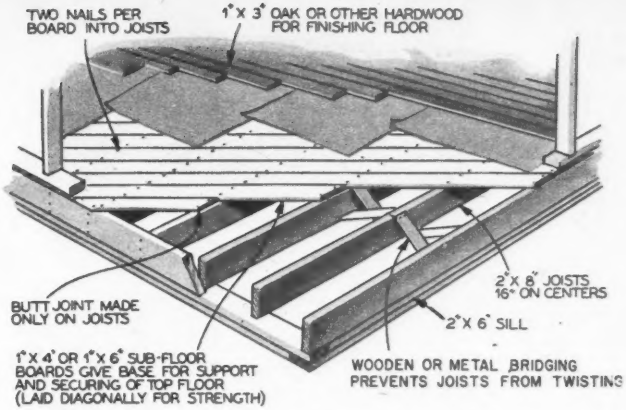
Diagonally laid blocks must be sawed diagonally to fit along the walls. The saw cuts need not be neat—they will be hidden by the base molds.

Diagonal bracing between the joists is called bridging. It should be installed between all joists that have spans of eight feet or more.

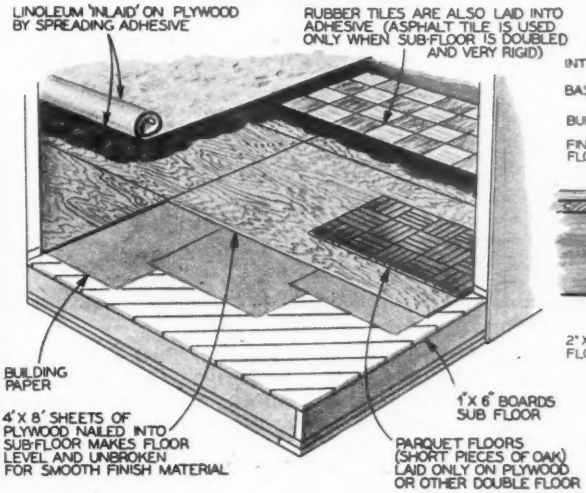


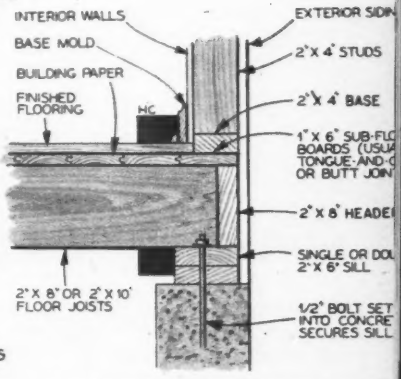
Metal bridging is used in the attic floor shown below. In long joist spans, bridging should be placed at intervals of approximately six feet.





FLOOR CONSTRUCTION IN AVERAGE WOOD FRAME DWELLING



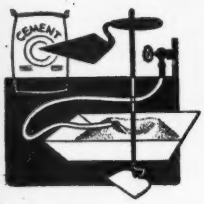


SECTION THROUGH FLOOR AT JUNCTION WITH WALL

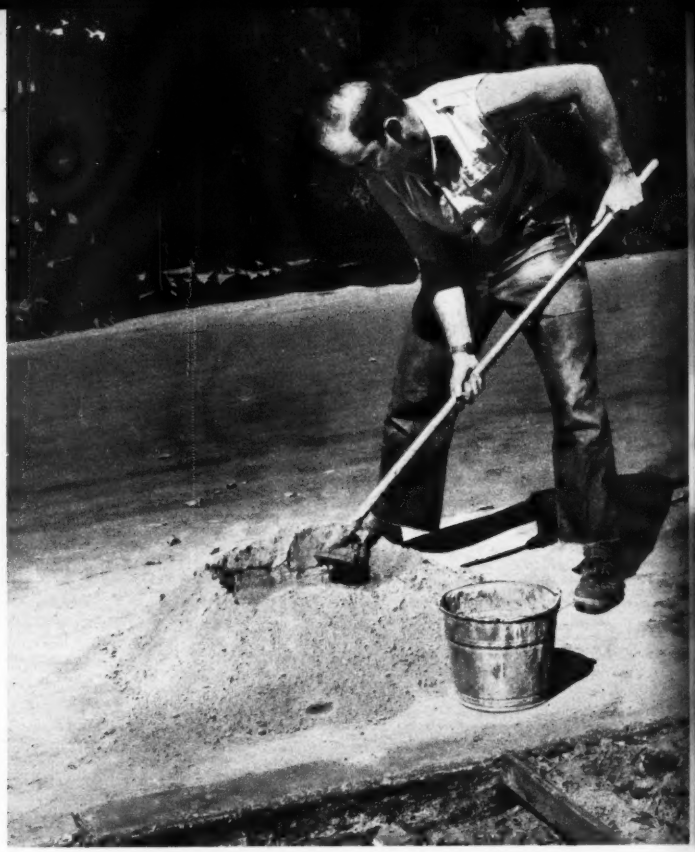
SEVERAL TYPES OF FINISHED FLOORS AND THEIR APPLICATION

Goodyear Vinylite is a tough plastic material that is completely impervious to the action of alkalies, mild acids, soaps, oils, and greases.

Linoleum has come a long way since it was first used in the kitchen. Tempting patterns such as this one are available for all types of rooms.



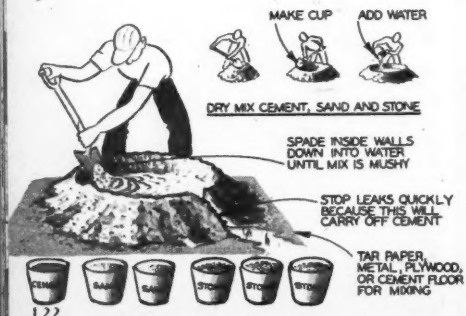
CEMENT and how to use it



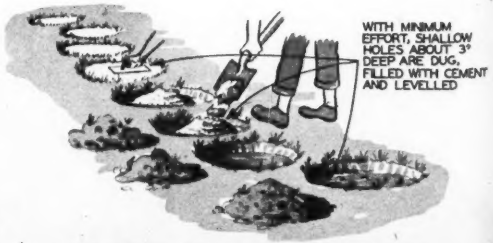
By Milton Nichols

EVERYONE knows that concrete is tough and durable. It is firesafe, long-lived, insect and rot proof. But, not everyone knows how easy it is to use. Mixing good concrete is much like baking a cake (but easier). It is largely a matter of following a recipe. The recipe includes sand, aggregate (gravel or crushed stone), cement and clean water. These ingredients must be balanced and accurately measured for each job. Whether you are building steps, a sidewalk, garden pools or a flagstone terrace, the mixture must be properly proportioned, thoroughly mixed, then placed in the forms within thirty minutes. As soon as you wet the cement, a chemical reaction starts and it begins to set. Mix only what can be placed within the half hour.

When mixed in the proper proportions cement and water form a paste which will harden and cement together the particles of sand and coarse aggregate. The careless use of too much water in the mix thins out the cementing paste, weakening it and reducing the durability of the concrete. The right amount of water yields a paste with



122
MATERIALS AND METHOD OF HAND MIXING CONCRETE



SIMPLE METHOD OF MAKING STEPPING STONES ON LAWN

The area to be patched should be undercut on all sides.

Measure out required amount of sand and cement, see table.

Thoroughly mix the sand and the cement to a uniform color.

Add water for mix. Too much means weak concrete.

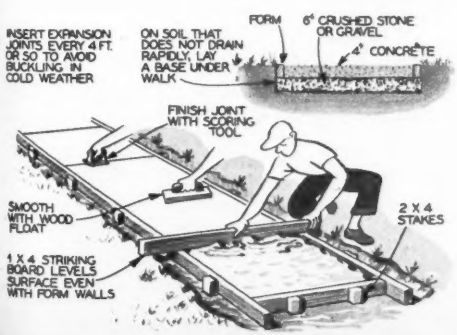
Mix only enough concrete that you can use within a half-hour.

A long board is used as a strike to level the concrete.

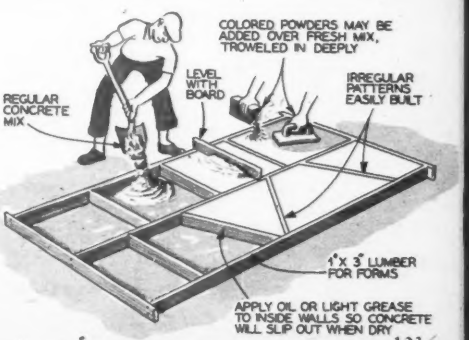
high strength. The water should be clean, fit to drink, for mixing with cement.

Sand is generally delivered in various states of wetness. Damp sand feels slightly damp to the touch and leaves very little moisture on the hands. Wet sand is the kind usually delivered and leaves the hands moist after being handled. Proper allowance must be made for the water in the sand that is used.

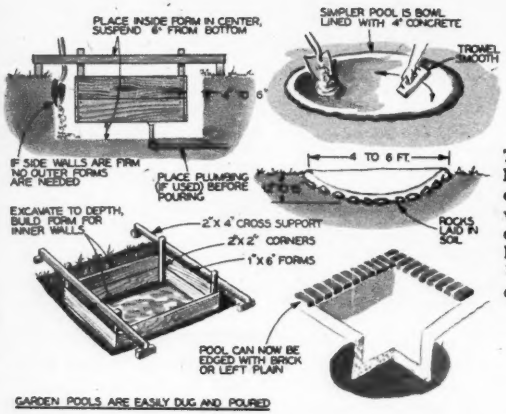
Bank run, the natural mixture of fine and course aggregate, often contains an excess of fine material. This will require the use of more cement to produce a concrete of the desired quality. If there is any doubt about the cleanliness of the bank run material, a silt test should be run. The silt test, which is also used to check the sand is simply performed: Put 2 inches of the sample in the bottom of a fruit jar and add water until the jar is ¾ full. Shake vigorously for a minute. Then swirl the liquid so as to level the material. Put aside for about an hour, then examine and measure the depth of the silt layer which settled on top. Do not use the bank run if the silt



POURING A WALK USING 2 X 4 FORMS ALONG SIDES



MAKING A FORM AND POURING SLABS FOR FLAGSTONES



GARDEN POOLS ARE EASILY DUG AND POURED

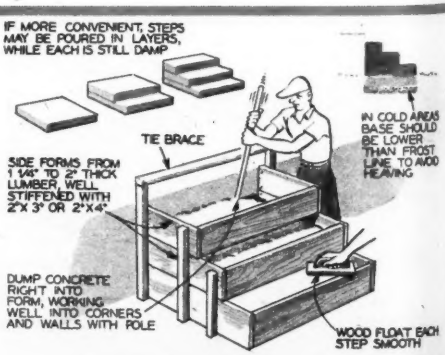
To test for silt, fill a Mason jar with the aggregate and add water. Swirl about and let stand for an hour. More than an ⅛th in. of silt is cause for rejection.

RECOMMENDED MIXTURES FOR SEVERAL CLASSES OF CONSTRUCTION*

Intended primarily for use on small jobs

KIND OF WORK	U.S. GALLONS OF WATER TO ADD TO EACH 1-SACK BATCH			TRIAL MIXTURE FOR FIRST BATCH			MAXIMUM AGGREGATE SIZE
	Damp sand and pebbles	Wet sand and pebbles	Very wet sand and pebbles	Cement	Sand	Pebbles	
		Average sand		sacks	cu. ft.	cu. ft.	in.
Foundation walls which need not be watertight, mass concrete for footings, retaining walls, garden walls, etc.	6¼	5½	4¾	1	2¾	4	1½
Watertight basement walls, walls above ground, lawn rollers, hotbeds, cold frames, etc. Well curbs and platforms, cisterns, septic tanks, watertight floors, sidewalks, steppingstone and flagstone walks, driveways, play courts, outdoor fireplace base and walls, refuse burners, ash receptacles, porch floors, basement floors, garden and lawn pools, steps, corner posts, gate posts, piers, columns, etc.	5½	Average sand 5	4¼	1	2¼	3	1½
Fence posts, grape arbor posts, mailbox posts, etc., flower boxes and pots, benches, bird baths, sun dials, pedestals and other garden furniture, work of very thin sections.	4½	Average sand 4	3¾	1	1¾	2	¾

POURING A CURVED SECTION FOR WALK OR DRIVE



LAYING UP A SOLID CONCRETE FLIGHT OF STEPS

*Courtesy of Portland Cement Association

Strike board or screed is pushed back and forth in sawing motion to level concrete.

Lines scored every few feet add to appearance and also help (but do not prevent) to check cracks.

To repair a narrow crack in pavement, chisel it out to at least a half-inch in width.

layer is more than ⅛ in. high. Washed aggregate without silt can be purchased from dealers.

In cold weather new concrete should be protected to keep the temperature above 50°F. for at least five days, or above 70°F. for three days. Materials and water can be used in freezing weather if they are first heated. A temperature of 150°F. is the maximum, if heated above that the hot mix may cause a "flash" set in the cement.

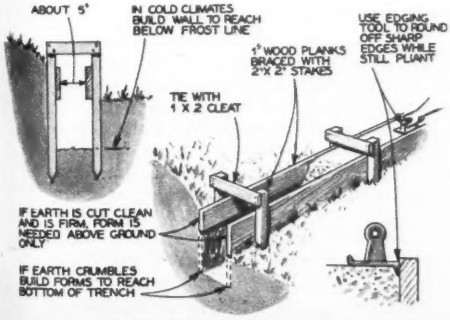
Well, let's get started and fix that damaged sidewalk or driveway. The first thing to do is to plan the job and determine the amount of materials needed. A pail marked on the inside to show quarts or gallons will be found handy. It can be used for measuring water as well as the sand or aggregate. Or, you can make a bottomless box to hold one cubic foot. A bag of cement holds one cubic foot (which is why it weighs 94 pounds and not an even 100).

Here is the recipe for mixing by hand:

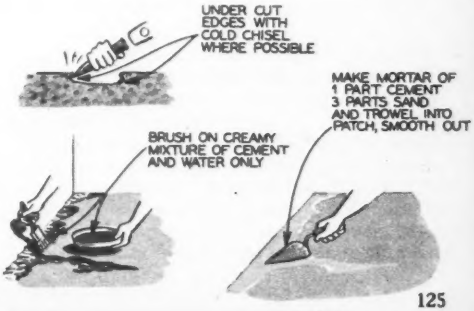
Spread out the measured amount of sand, add the required cement, mix with a hoe or shovel until the color is uniform. Streaks of brown and gray show that the sand and cement are not fully blended. Next spread the measured amount of course aggregate over the sand and cement mixture. Hoe until uniformly distributed. Make a hollow in the middle of the pile and add the correct amount of water. Hoe or shovel the inside walls into the water until the mix is mushy. Mix thoroughly until all ingredients have been uniformly combined.

After the concrete is thoroughly mixed it must be placed in the previously prepared form or area to be patched within 30 minutes after mixing. Tamp or spade the coarse aggregate away from the face to make a dense, solid, smooth surface. Use a strike board for leveling. Several hours later when the concrete has set it is finished with a wood float to produce an even surface. For an extra smooth finish, a steel trowel is used after the wood float.

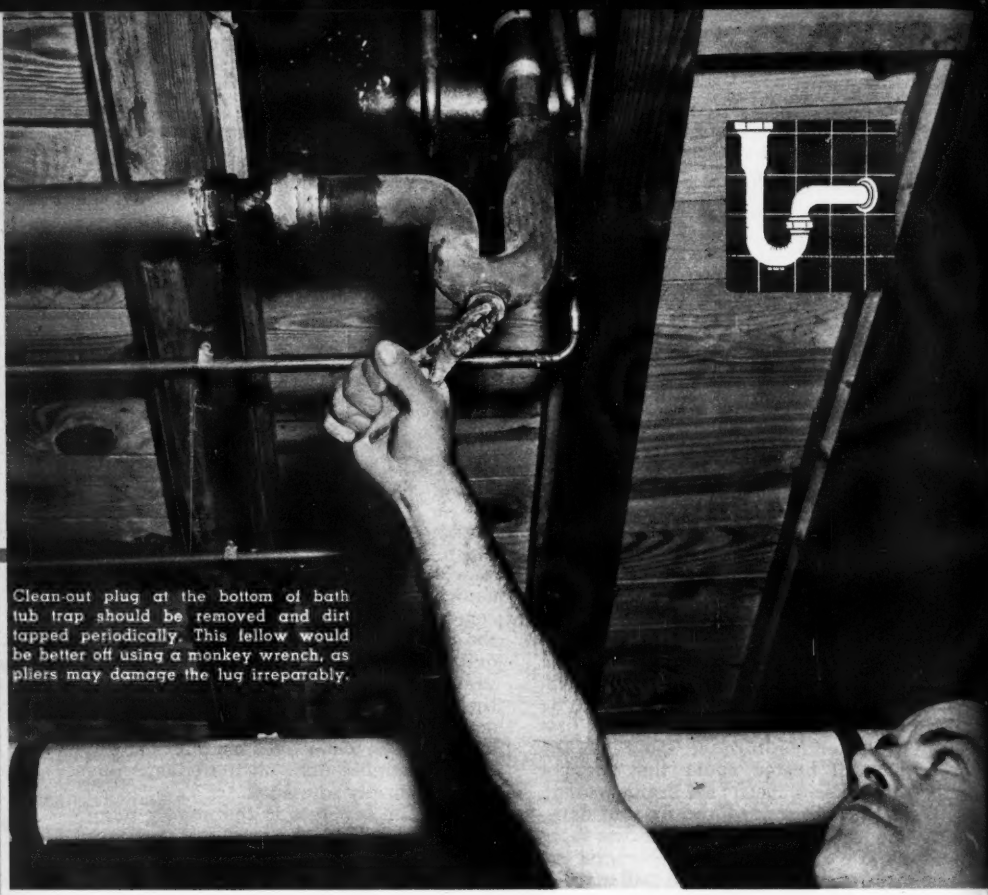
Sidewalks are generally made in sections, 4 to 5 ft. wide, rear walks are 1½ to 3 ft. wide. In new [*Continued on page* 156]



POURING A LAWN CURBING OR OTHER RETAINING WALL



REPAIRING CRACKS OR PITS IN CEMENT FLOORS



Clean-out plug at the bottom of bath tub trap should be removed and dirt tapped periodically. This fellow would be better off using a monkey wrench, as pliers may damage the lug irreparably.

The Plumbing System

Careful forethought and planning will make this vital installation your pipeline to comfort and easy living.

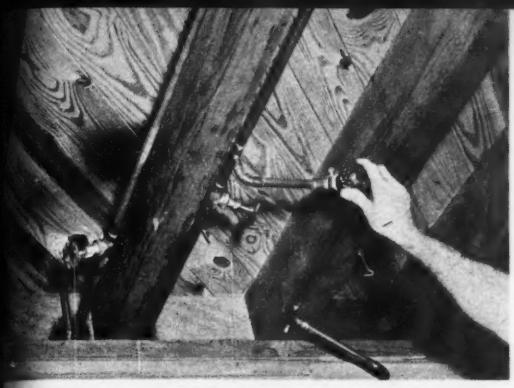
Richard Henn, Jr.

Plumbing And Heating Industries Bureau

PLUMBING for the one-family home consists of the "visible" and "invisible" portions. The visible portion of household plumbing is comprised of those plumbing fixtures installed in the bathrooms, kitchen, and laundry. The invisible portion consists of the piping. The entire plumbing system should be planned with the future in mind, because a growing family can make an inadequate system obsolete in a few years.

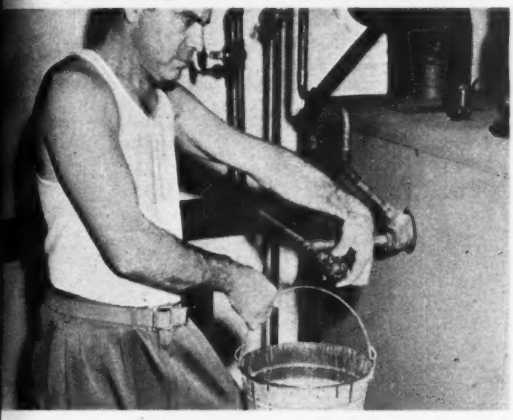
In designing the plumbing system for a house, the experienced plumbing contractor will first total the water consumption for all fixtures. The capacity of the piping system should, at the very least, be sufficient to permit the simultaneous use of all fixtures which are likely to be used at the same time.

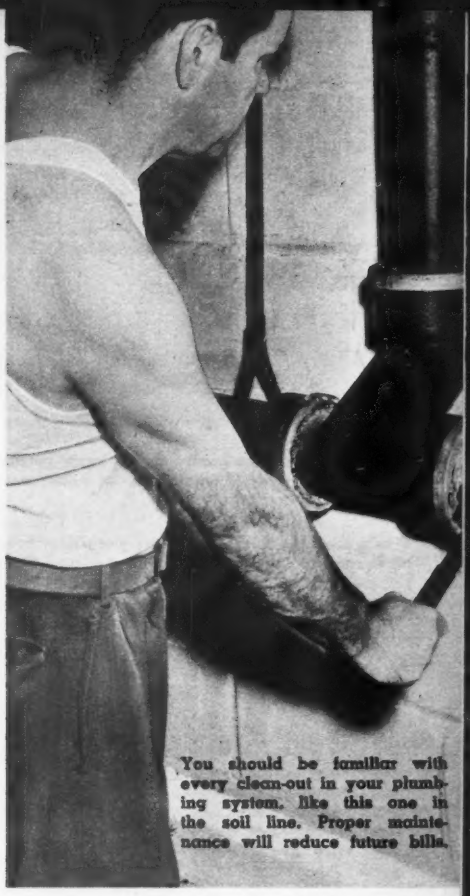
It is recommended that pipe capacities provide for a flow of water in excess of the



The hot-water and cold-water lines to the sinks have individual shut-off valves placed adjacently.

Sediment should be removed from your hot-water heater every three months for best performance.





You should be familiar with every clean-out in your plumbing system, like this one in the soil line. Proper maintenance will reduce future bills.

expected simultaneous requirements of the fixtures. The supply and waste pipe not only should be adequate for immediate requirements, but should have sufficient capacity to handle additional fixtures or appliances which might be added in the future. The added cost of a slightly larger pipe is inconsequential compared to the convenience of an adequate free-flowing supply of water at all fixtures and drain lines.

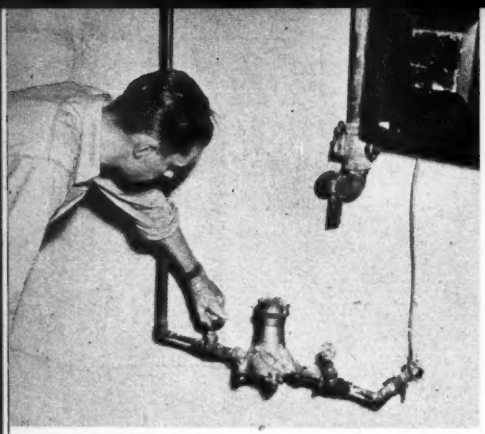
The master plumber will design the supply piping so as to avoid unnecessary changes in the direction of the piping. Every elbow introduces friction losses into the line, which reduce the flow of water. It may be desirable to leave stubs of pipe for future fixtures.

The hot-water pipe should be well insulated. If there are cold-water lines in exterior walls or in the attic, they should also be insulated—at least, in most sections of the country.

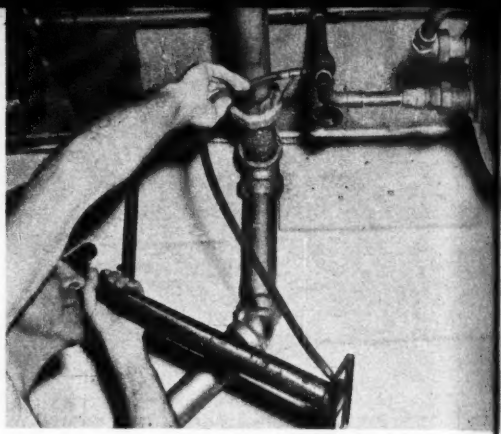
Plumbing for the entire home should be centralized as much as possible. In a one-story structure, "backing-up" fixtures in the adjacent bathroom, kitchen, and utility room will save money. The wall which separates these rooms conceals the hidden piping for all fixtures.

A third-dimensional concept of this same arrangement holds true in a two-story home, where the plumbing structure resembles a tall slender tree with periodic clumps of small branches. The basement will house the water heater and laundry room. On the first floor, the bathroom and kitchen should be placed back-to-back. Or for greater convenience, this floor can feature a three-way arrangement of adjoining bathroom, powder room and kitchen. The layout of the second floor should also follow this plan. In this manner, one installation of supply piping, and soil and waste piping serves the entire system.

Yet convenience and accessibility should always be foremost considerations of bathroom planning. These considerations apply to the extra bathroom that is to be installed

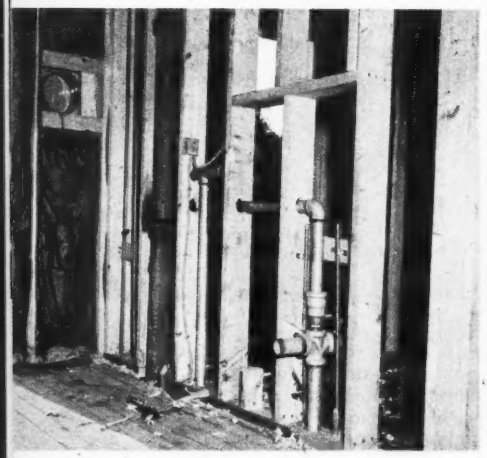


Every member of the family should know position of the turn-off valve, usually placed near meter.

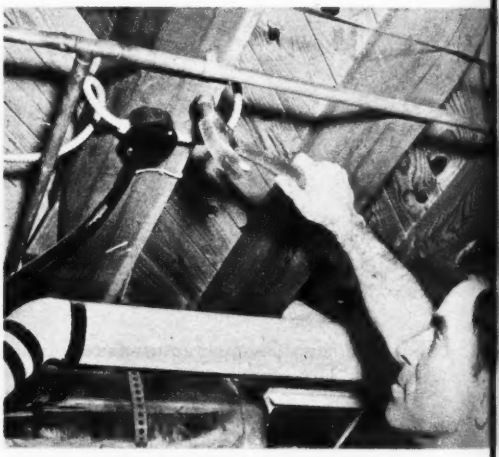


One method of blowing out water through hot-water tank. Pump hose is screwed to valve nipple.

Where feasible, this setup offers more floor area: pipes are placed through holes cut into studs.



Overhead water lines in cellar should be firmly secured to joists with pipe strap or brackets.



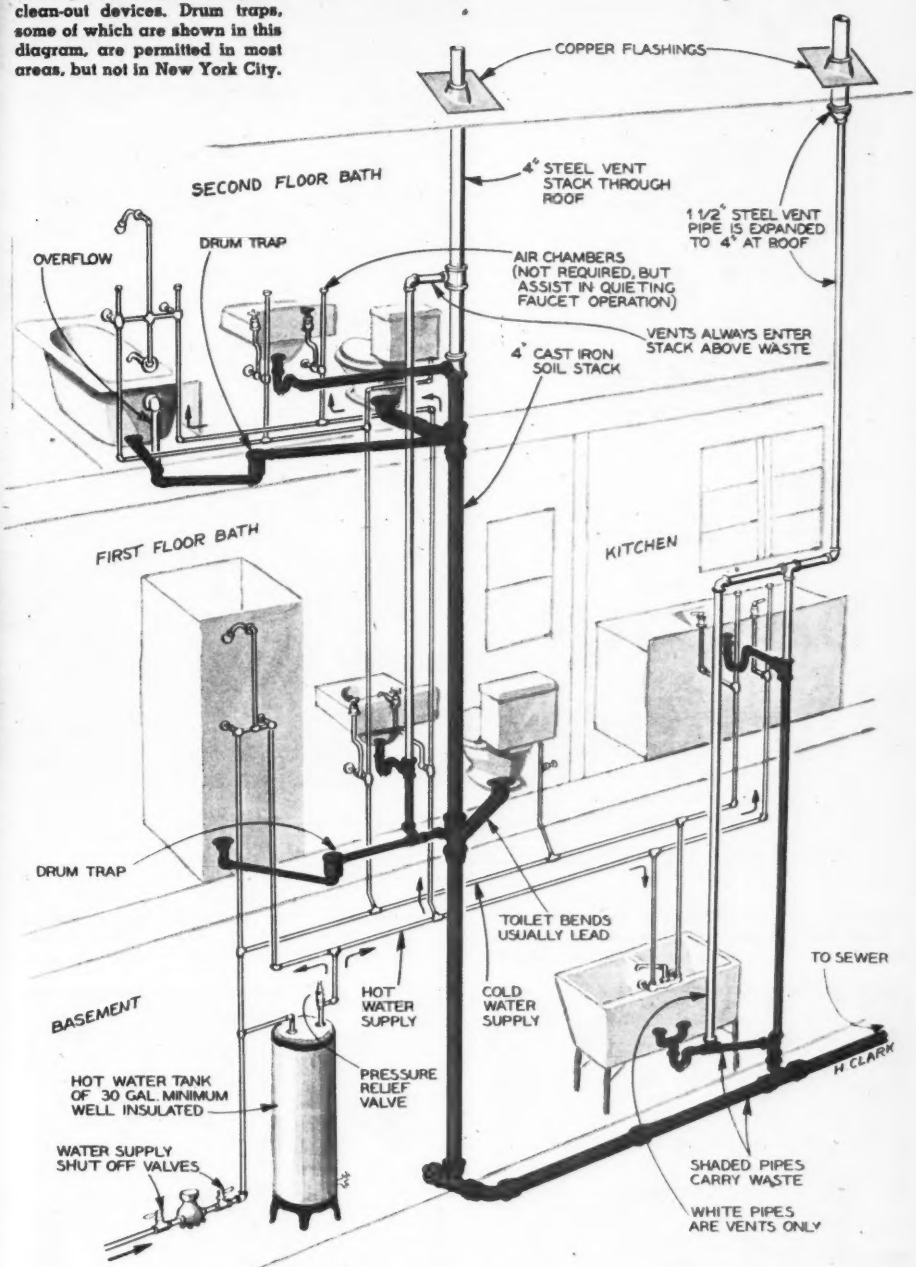
in an existing house, as well as to the bathrooms in a new house.

Here are a few sugggestions for bathroom planning: 1. Avoid placing the bath tub under a window. 2. Provide for adequate ventilation. 3. Have ample lighting facilities, both natural and artificial. 4. Plan for plenty of storage space. 5. Plan the bathroom for an easy flow of traffic. 6. Include some safety features such as a grab bar over the bath tub and rubber mats under bathroom rugs. 7. It is advisable to plan for at least one bathtub for the use of children, elderly people, warm-soaking treatments for colds and hypertension, and with an eye to the future saleability of the house. 8. Your fixtures should be properly installed under the careful supervision of an experienced master plumber.

The size, quality, type, and location of valves has an important bearing on plumbing system performance. There are two types of valves generally used in residential plumbing work—the gate valve and the globe valve.

The gate valve offers virtually no restriction to the flow of fluids through it. As the name implies, it is a gate that can stop completely the flow of fluids, or through which the fluids can flow freely when the valve is fully opened. Gate valves should be operated fully opened or fully closed, never to "throttle" or regulate the flow. The globe valve, on the other hand, is designed to contact or regulate the flow of fluids. It can be [*Continued on page* 151]

All traps should have adequate clean-out devices. Drum traps, some of which are shown in this diagram, are permitted in most areas, but not in New York City.



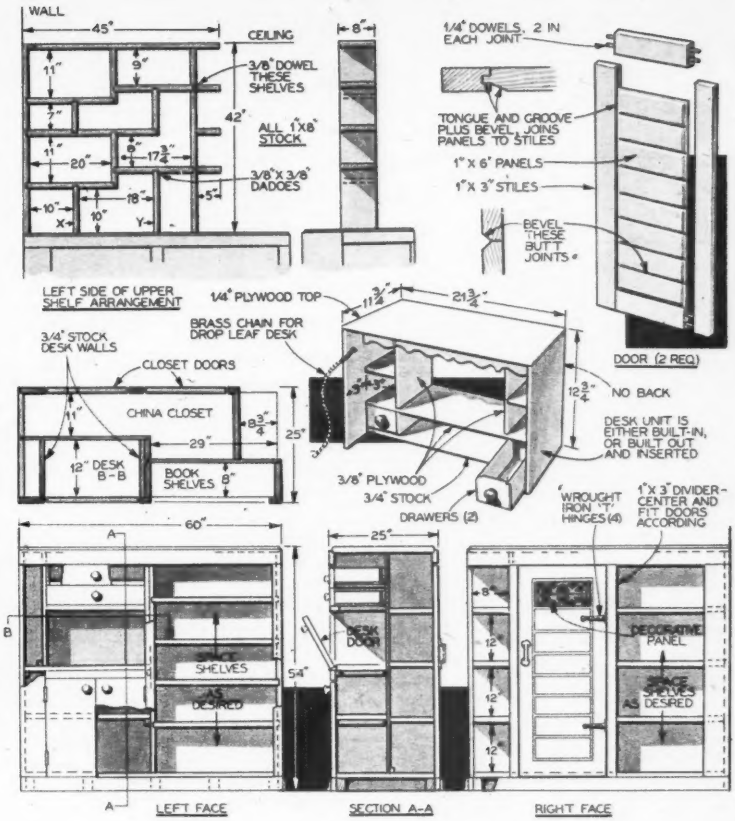
COMPLETE WATER SUPPLY AND WASTE DISPOSAL SYSTEM FOR AVERAGE TWO FLOOR HOUSE WITH BASEMENT, SHOWING EFFICIENT FIXTURE GROUPING ELIMINATING LONG COSTLY RUNS OF PIPING

Space Saving Partition

Divide living and dining areas with this combination china cabinet, desk, bookcase, and knickknackatory.

View from the dinette side of the partition. It is a pleasure to set a table when the china is stored nearby rather than in a kitchen cabinet.

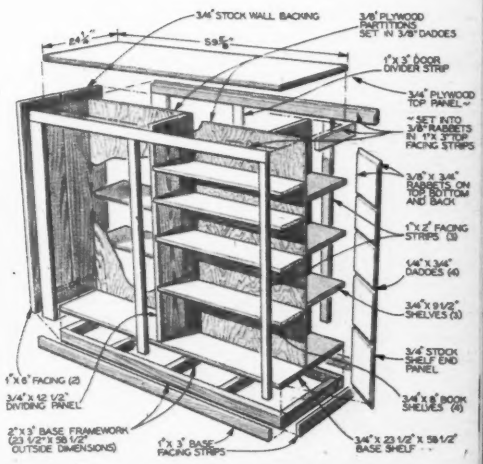
Close-up of the desk unit. Two drawers above the unit and a cupboard below it are used for storing stationery and other writing supplies.



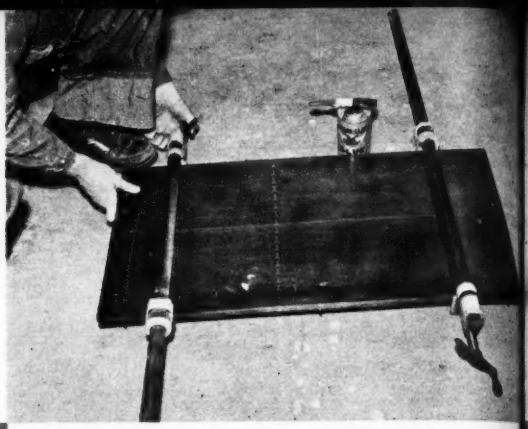
By Edward R. Lucas

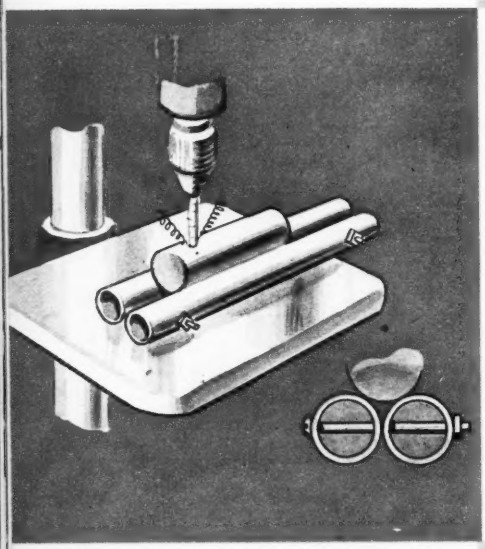
YOU can't squeeze more utility out of any ten square feet of floor space in your entire home than you can with this space-hoarding combination cabinet-partition. While particularly well adapted to the type of floor plan where the living and dining areas are treated as parts of one room, being separated only by a counter or partial partition, the unit is equally adaptable for use between dinette and kitchen. Its multiple functions include use as (1) partition, (2) writing desk, (3) bookcase, (4) knickknackatory, and (5) china cupboard.

Despite considerable detail, construction is basically simple. If the over-all dimensions won't fit properly between your living and dining areas, they can be modified considerably without altering the [*Continued on page* 158]



SHOP SHORTS



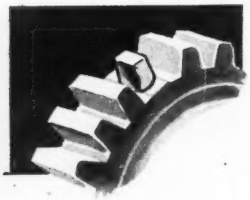


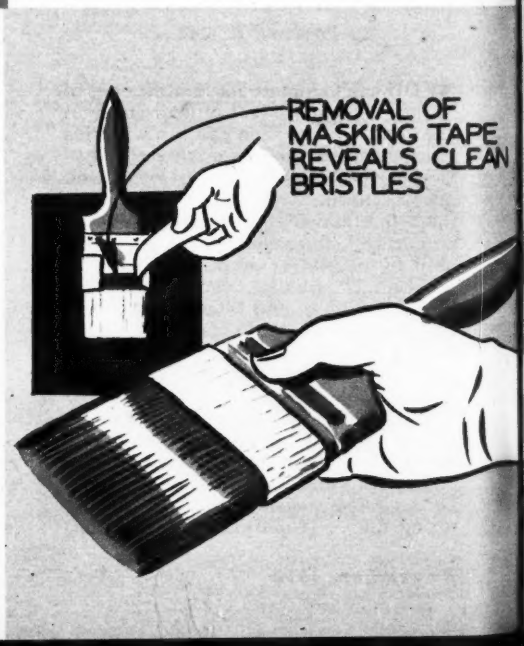
Spare table extension boards, above, can be combined to make excellent table or bookcase tops in your shop. Since they are already bored and doweled, it's easy to glue them up into a single panel, as shown.

Vee block for holding round stock during drilling operation can be improvised by fastening two scraps of pipe. A bolt through each of the ends keeps them parallel so that stock is held without rolling in the groove.

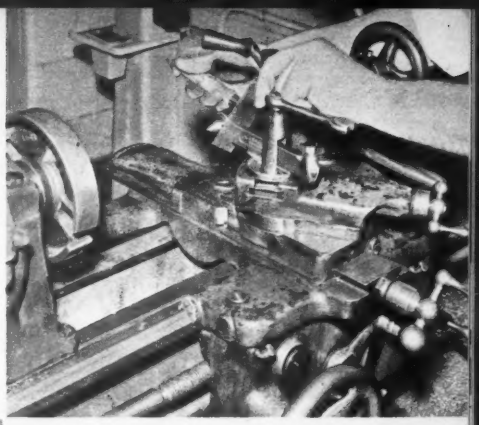
A clean ferrule on your paint brush makes brush easier to clean when you're through for the day. To achieve this, put a strip of masking tape around the brush so that it covers top bristles and ferrule.

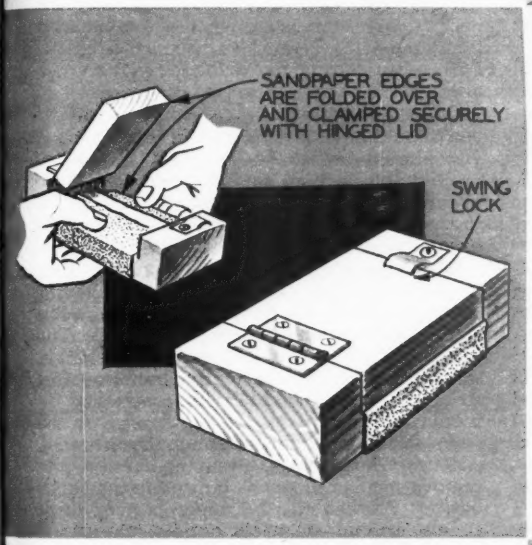
Rapid gear repair may be made by substituting a stud for a broken tooth. Drill and tap a hole as indicated below, then file stud to shape. You'll find that the stud will offer sufficient surface and friction.





To measure tailstock setover, use this accurate method instead of a scale, if you want your centers to be in perfect alignment after a taper-turning job. Insert piece of thin shim metal between back end of the tool holder and tailstock spindle. Determine the exact micrometer distance of the desired offset. Loosen tailstock clamping nut and back off one set screw. Next tighten the other unit until the shim again just clears the tool holder. To reset to the exact center, just reverse this procedure.

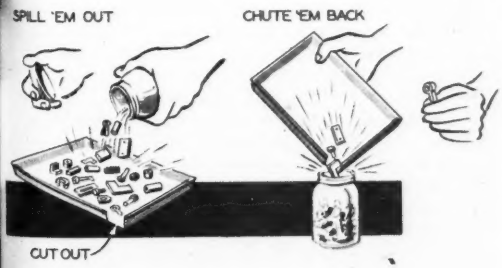




Ingenious sanding block can be made by home craftsmen in a matter of minutes. The hinged lid with its swing lock keeps abrasive firmly in place. This device will lengthen life span of your sandpaper.

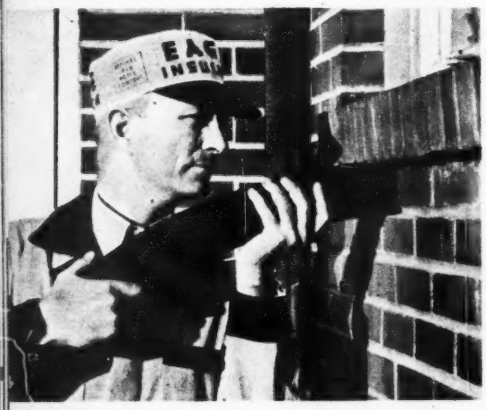
Identify your tools by engraving your name on them with a steel burr used in conjunction with any of these small power tools. Burr is hard enough to bite into the toughest metal, as indicated in photo below.

Handy sorting tray for small parts will save time when looking for a specific item in those crowded jars. If you cut out one corner of a small cake pan, you'll be able to find whatever you need instantly, then return the items rapidly to container.



Insulate And Save

[*Continued from page* 107]



Eagle-Picher mineral-wool insulation being blown pneumatically into a brick home. This insulation can be installed in either new homes or old ones.

insulation, but there is a point of diminishing returns—a point where added insulation gives little additional effectiveness.

For example, a wall insulated with a 1-in. blanket will show a heat-loss reduction of 48 per cent when compared to an uninsulated wall, a 2-in. blanket will reduce heat loss 62.4 per cent, a 3-in. blanket will reduce heat loss 69.6 per cent, and a 3⅝-in. blanket will reduce heat loss 71.6 per cent. The added amount of heat-loss reduction brought about by a 3⅝-in. blanket, compared to a 3-in. blanket, is only two per cent. That's what is meant by a "point of diminishing return." And it is for this reason that insulation manufacturers seldom produce a type thicker than three inches.

These areas are suggested as the most logical candidates for insulation: all exterior walls, all walls next to unheated areas such as attached garages and attic stairs, attic floors or (in flat-roofed houses) the spaces between ceilings and roofs, first floors in houses with crawl spaces under them, and floors of rooms over unheated porches or garages.

As mentioned above, many insulating materials can be installed easily by the home owner himself. Others are best installed by a licensed commercial applicator. If you are interested in having blowing wool installed in the walls or attic of your home, consult the yellow pages of your telephone directory for the names of the applicators in your locality. Such well-known companies as Owens-Corning Fiberglas Corp., Johns-Manville Corp., and Eagle-Picher Co. have reliable applicators in principal cities.

When installing your own insulation, the easiest place to start is in the attic. If the floor is boarded over, it will be necessary for you to take up all of the boards. If you are using loose-fill insulation, pour the material into the spaces between the joists to a depth of from two to four inches. Be sure when pouring that no air pockets are formed. If installing blankets, arrange for an air space underneath each length to obtain better efficiency. This is done by securing the paper flanges to the joists near enough to their top faces so the blankets can't touch the ceilings of the rooms below. Before purchasing the blankets, you should, of course, check the distance between joists so you can get material of the correct width. If you should have a nonstandard joist spacing, you should switch to loose-fill insulation. (*Note*: If you plan to finish off your attic eventually, the insulation should be applied to the wall studs and the roof rafters rather than to the floor joists.)

When securing blanketing to a side wall, or a sloping roof, allow sufficient length for cramming below the floor line (to act as a fire stop) and for attachment at the top. The vapor-barrier or flange side of the blanket should face the inside of the building. Cut strips of the material to fit all corners and irregular spaces, always leaving flanges on the vapor-barrier side for fastening. If you should encounter large pipes, it may be necessary to remove some of the wool, but retain the vapor barrier. Always cut the vapor barrier to fit snugly around electrical outlets, pipes, and other obstacles.

If you use batts for insulating your walls and rafter area, be sure they are butted together as closely as possible. If you come upon odd-shaped spaces, break batts to proper sizes and fit them in.

To insulate a basement room, you must first install 1x2-in. or 2x2-in. furring strips vertically on the masonry walls, taking care that they are spaced 16 in. on centers. When the walls are solid concrete, make fastening holes with a masonry drill and secure the furring strips with expansion bolts. Attach blanket insulation to the furring strips, remembering to separate the insulation from the masonry by an air space. Fasten the ends of the insulation to sills, plates, and headers.

Insulation authorities emphasize that the space above an insulated ceiling should be ventilated to the outside air so that water vapor is carried off. Use at least two louvers to provide good air circulation. Allow about one square foot of opening for each 250 sq. ft. of attic floor area. •

Your Home In Miniature

[Continued from page 96]

Here's the house model that appears on our cover. It was a recent House-of-the-Month choice by the Monthly Small House Club, 140 Nassau St., N. Y. C.

cardboard furniture for planning room arrangements and paints and a brush for working out color schemes. The only tools you need are a pair of scissors and a razor blade. Mr. Rust has found that even people with ten thumbs can build a model in three or four evenings.

A sample floor plan is included in the kit, but you can work with any of scores of floor plans on sale at lumber yards and department stores, or your architect can give you a tentative plan. The kit also contains several strips of ruled cardboard and two bags of small metal clips. The cardboard is for the walls and is lined into ¼-in. squares. (Everything in the kit is to the standard scale of ¼ in. equals 1 ft.) Half the clips have points, the others do not. The pointed clips are pushed into the "floor" and used to hold the walls in place. The clips without points hold the walls together at the ceiling level.

The first step is to paste or pin the floor plan down on a piece of heavy cardboard or wallboard. Place a pointed clip wherever a corner is shown on the floor plan. Cut walls into proper lengths and set them up on the clips. Cut out windows and doors wherever they are indicated on the floor plan.

Once the walls are up and the roof put together (the kit provides both materials and instructions for building a roof of any pitch), you're ready to start working on the finer details. The kit contains sheets of paper simulating shingles, brick, stone, and other building materials. These can be cut and pasted on roof, exteriors, fireplace chimneys, etc., for realism.

The paper furniture is to scale and comes die-cut so that it can be pasted together like a child's cutout. Your wife will have a lot of fun pushing toy chairs, tables, and beds around, making sure there'll be enough space in a bedroom to dress without having to climb on the dresser. Maybe you'll find the architect has a door swinging the wrong way so that you can't get a favorite chest of drawers up against the wall. It's easy to make the correction on paper.

Twelve concentrated oil colors come in tiny capsules. Mr. Rust says these colors, blended with white, can produce more than 6,000 shades for painting walls or tinting furniture.

If you have the time, inclination, and skill, you can make a show-piece model. Felt can be purchased and used to simulate rugs and a lawn. Pieces of sponge, trimmed and mounted on wire, make passable trees and shrubbery for landscaping. For a few cents, hobby shops can give you enough balsa wood for a fence. But mostly you'll be interested in seeing how your dream house will look in three dimensions, and the kit's primary function is to provide you with the material to build a replica.

Mr. Rust developed the kit after watching his daughter spend hours puzzling over blueprints of her home-to-be. He has built models of more than 150 types of plans and found the kit was adaptable to every type.

Architects say models are not new, but hitherto they have been expensive and had to be supplemented with floor plans. First you'd look at the model, then check the plan, and try to connect the two. Now, by building right on the floor plan, you get an exact reproduction.

The clips, a patented feature, hold the walls rigidly and are the secret of the kit's success. They can be used over and over. Mr. Hoyt sells the kit for $4.95 postpaid. His address is 173 Marion Street, Denver, Col.

—*Bill Hosokawa* •

Using a battery-powered outboard motor, this handsome model really performs beautifully. Construction is mostly of balsa, with plywood added where extra strength is required. For your copy of these complete, full size plans, remit 50 cents to MECHANIX ILLUSTRATED Plans Service, Fawcett Bldg., Greenwich, Conn. Please specify Plan No. 420.

CARE WILL SAVE YOUR CAR

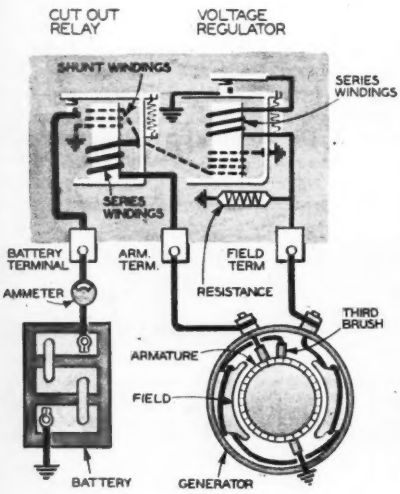
car care

By Frederick C. Russell

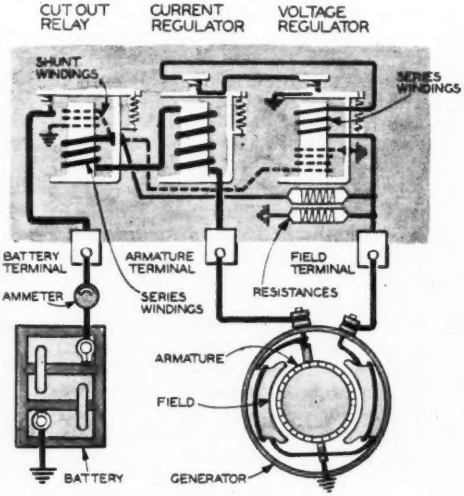
The Voltage Regulator

LIKE the carburetor the voltage regulator, or generator regulator as it is sometimes called, is one of the least understood units of the modern car. It is blamed for just about every electrical condition in the book. In addition, it is a challenge to the mechanically-minded car owner. Often enough, it even throws the experienced mechanic for an unexpected loop. What puzzles some folks is why regulators are needed at all.

The practical motorist wants to know how cars got along without this gadget back in the 1930's. It's all quite simple. Early generators were of the adjustable third brush type. That is, the third brush

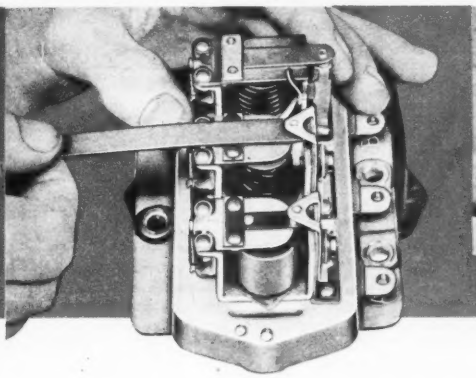


TWO UNIT REGULATOR WIRING

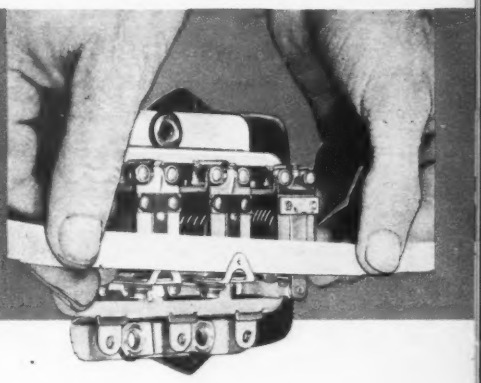


THREE UNIT REGULATOR WIRING

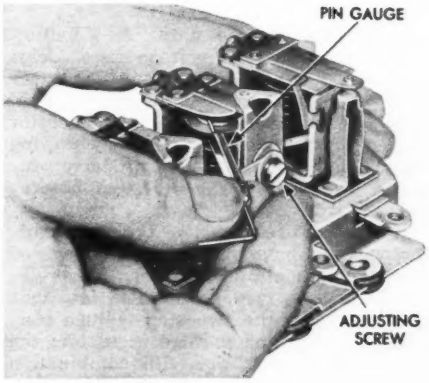
Pitted contact points should be refaced with a fine file drawn lengthwise and parallel to armature.



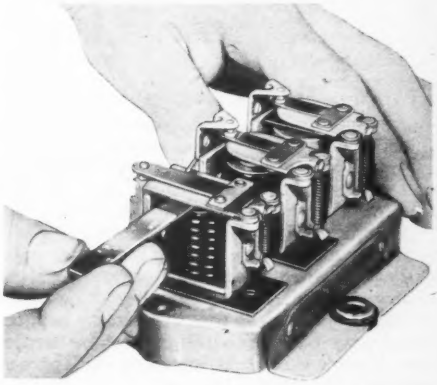
After filing, points should be cleaned by drawing a strip of linen or lintless tape between them.



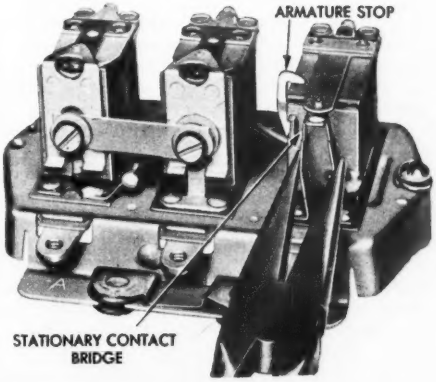
Below: Pin gauge, made for this purpose, should be used to measure voltage and current regulator gap.



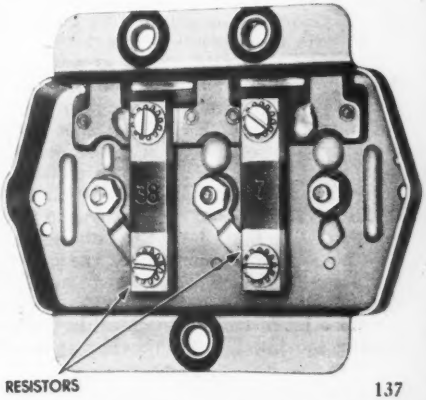
Below: Checking circuit breaker air gap on Plymouth cars is done with a .031 to .034 in. flat gauge.



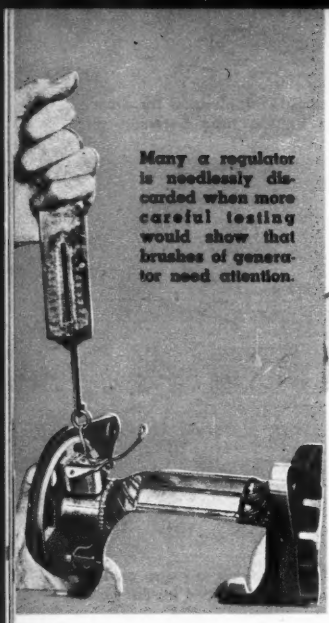
Below: Adjustment of circuit breaker contact points on Chrysler cars is made with special bending tool.



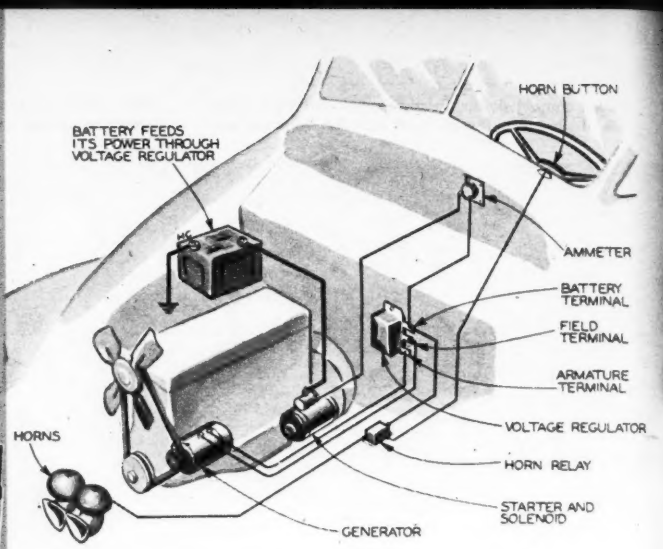
Below: Easily overlooked when checking the regulator is damage to resistors in bottom of case.



Photos courtesy of Auto-Lite and Delco Remy



Many a regulator is needlessly discarded when more careful testing would show that brushes of generator need attention.



WIRING DIAGRAM SHOWS POWER LINES GOVERNED BY REGULATOR

could be moved so as to increase or decrease the current output. Of course, this system sooner or later had to give way to a more satisfactory arrangement using some sort of a regulator to control the output automatically. And that's how the voltage regulator came into the picture—the little black box which is usually mounted on the engine firewall. The voltage regulator is either a two or a three-part unit. In all regulators there is another unit known as the generator cutout which serves to break the circuit when the engine is idling, or dead, so that the battery cannot discharge back into the generator while the latter's output is low or nil. There's nothing new about the cutout. It used to be mounted atop the generator where its points occasionally stuck together to cause trouble just as they do today. But the other units of the regulator present wholly new experiences in automotive electricity—and with appropriate fireworks.

Right now you're justified in wanting to know how *current* can be controlled in a regulator when the device operates as a *voltage* regulator. Let's glance at a fundamental law of electricity—the one that tells us that the amount of current expressed in amperes is directly proportional to the voltage. That clears away a lot of mystery. We find that if the voltage in the field circuit increases so does the current. If voltage drops, current follows suit. This was ignored prior to the 1934 cars and so we got a lot of trouble such as the battery getting too much current when it was in a really fully charged state. As a battery becomes charged its voltage rises. This increases field coil voltage. A stronger flow of current passes through the field coils of the generator and the generator current output goes up. That sort of thing doesn't happen in a system properly protected with a generator regulator—provided it works.

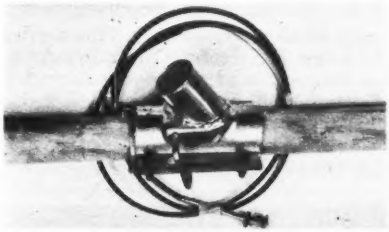
Regulators are of various types with differences that have to be carefully observed in trouble-shooting as well as in servicing. Roughly, they are divided into four general types: the two-step voltage control; the vibrating voltage regulator; the current regulator; and the combination voltage and current regulator. This makes it clear why replacement calls for a new unit *matching the original.* Without going into the technical details a two-step job has the same effect that could be obtained with use of two different generators—one of high output for times when the battery needs a lift, the other a low output generator for use when the battery's requirements are low. As with all regulators the two-step regulator doesn't increase the generator's capacity, although many motorists have this notion.

In the vibrating type regulator a resistance is used to cut in and cut out the field circuit of the generator. Whereas the two-step regulator provides only two charging rates the vibrating type has a wide range of charging rates to meet as many conditions. You might say that it provides a series [*Continued on page* 152]

Cast aluminum oil and anti-freeze dispenser is available from Astra Aluminum Co. of St. Charles, Mo., for car fans who like to do their own servicing.

Bowes Seal Fast method of repairing automobile inner tubes used by many service stations is now available in kit form for emergency road use.

NEW for your CAR

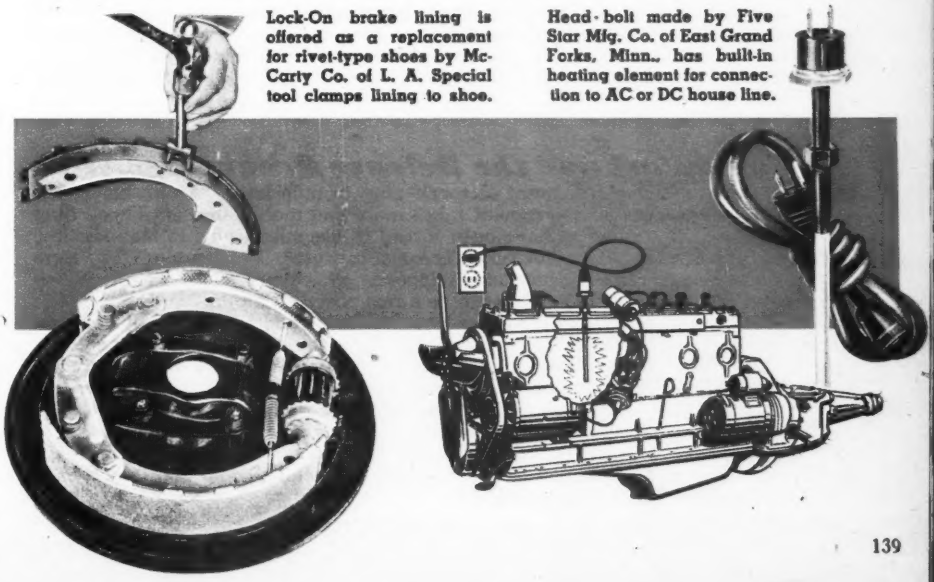


Exhaust cutout kit can be operated from dash to cut out muffler in non-restricted areas or for stock car racing. St. Louis Metal Products, Normandy, Mo.

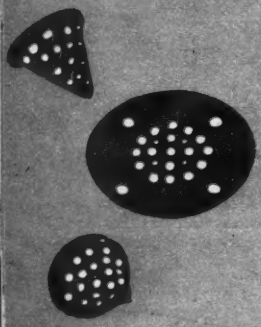
A brush can turn black tires into white wall jobs by means of kit made by Lowenthal Mfg. Co. of Chicago. Kit contains enough for five tires.

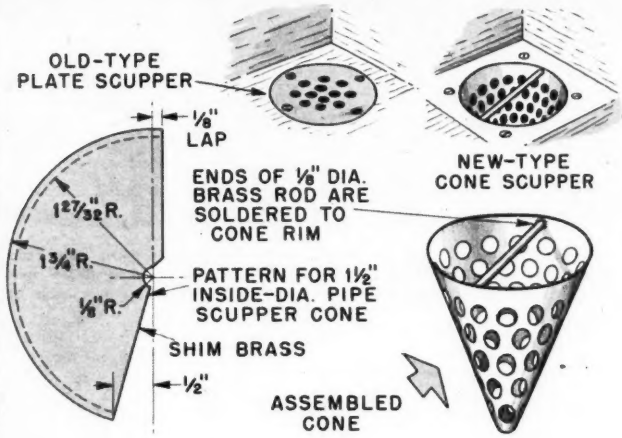
Lock-On brake lining is offered as a replacement for rivet-type shoes by McCarty Co. of L. A. Special tool clamps lining to shoe.

Head-bolt made by Five Star Mfg. Co. of East Grand Forks, Minn., has built-in heating element for connection to AC or DC house line.



BOATING KINKS

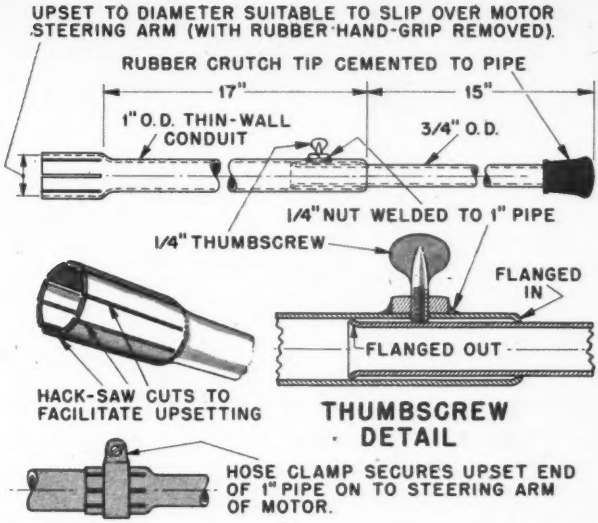




Practical Scupper Strainers. The commonly used flat strainer with holes in the top clogs up with trash and small particles very quickly. This results in a large pool of water on deck and more in the bilge. To eliminate this annoyance, I designed and built a brass cone, hammered a flange around the edge, soldered a 1/8-in.-dia. brass rod across the top for a handle, and drilled the cone full of 1/8-in. holes. The bottom of the cone forms a basin where trash can collect without stopping the flow of water. The strainer is easily lifted out for cleaning. The above pattern is for a cone that will fit a 1 1/2-in. scupper.—*George Brook Taylor.*

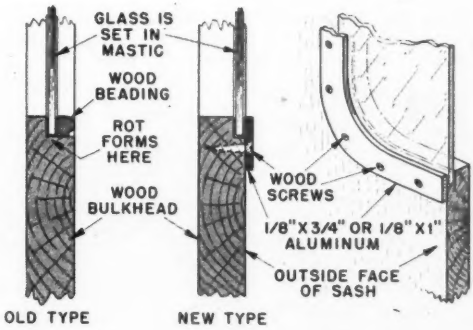
Emergency Spark-Plug Nut. I recently lost one of my outboard's spark-plug nuts out in the middle of Fishers Island Sound. Although I make it a practice to lash loose tools to cork or wooden floats, I had never thought of securing spark-plug nuts in a similar manner. Quite lively water prevented managing the boat and holding the wire to the plug at the same time. Luckily, I thought of the small can of oil I had in my tool kit. The soft metal screw cap fitted the threaded plug stud perfectly and in fact is still in place. Needless to say, the tool kit now holds a few extra spark-plug nuts.—*G. E. F.*

Outboard Fuel and the Defense Program. Have you been having an uncommon amount of spark-plug trouble lately? Don't blame the motor or the plugs. As the government takes more and more Ethyl antiknock fluid for military use, the refineries have been forced to use substitutes to maintain the antiknock ratings of leaded motor fuels. These substitutes, it appears, tend to form heavier and more electrically conductive deposits on spark-plug electrodes. When first encountered, this sort of trouble can be a real poser. The plugs foul repeatedly, but when inspected they appear to be of normal color and dry, the only unusual things being hard, somewhat blistery deposits on the electrodes and specks of cindery material bridging the gaps. There is nothing that refiners or spark-plug manufacturers can do about this so long as the present emergency lasts. If you run into this kind of trouble, the cure lies with you. Use white or marine gasoline and any of the several oils made especially for outboard use. This will eliminate the source of the trouble—inferior leaded fuel. In addition, make sure that you are using the correct amount of oil, that the proper spark plugs are installed, and that they are set at the right gap.—*Robert J. Whittier.*

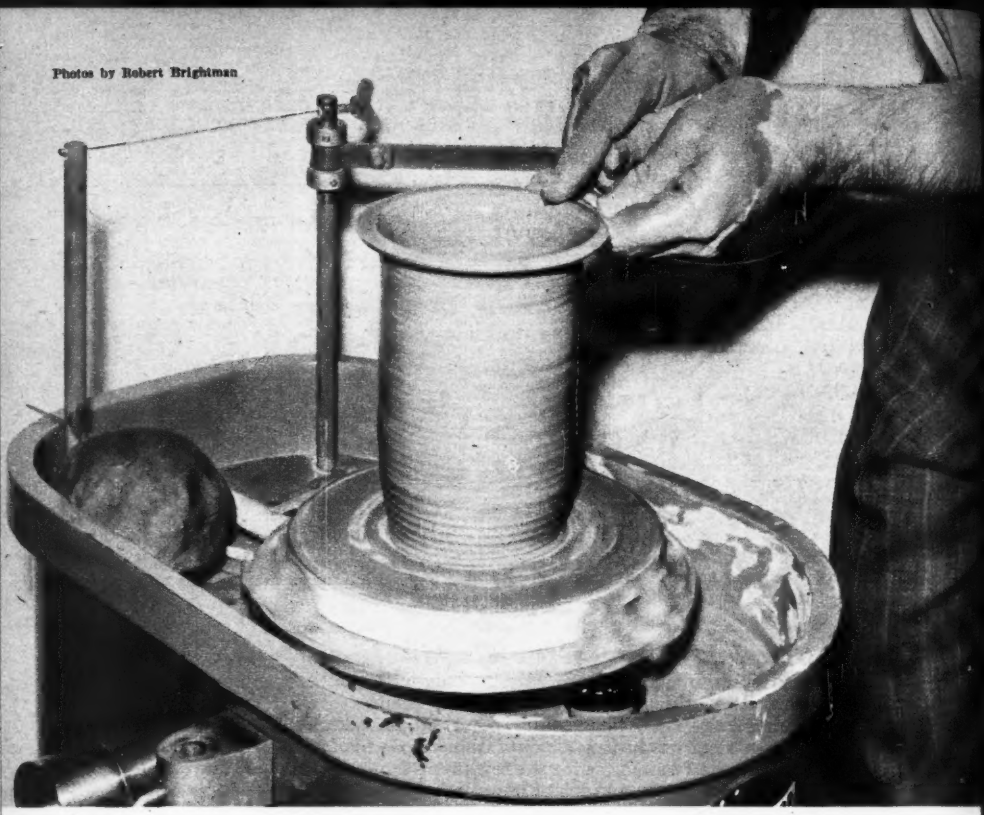


Outboard Motor Tiller Extension. Although some fishermen seem to like the idea of driving their boats with the bows about three feet out of the water, I have always subscribed to the theory that a boat's bottom should ride as level as possible. When fishing alone, proper balance is difficult to achieve. I solved the problem by putting an extension on my motor's steering arm. Its usefulness has more than repaid me for the few hours I spent making it. The accompanying drawings will give you an idea of how I fabricated and assembled it. Note that it telescopes so its length can be varied at will.—*G. Everett Fiedler.*

Watertight Fixed Sash. With a conventional fixed sash, which is set in a wide rabbet and held in place by a wooden beading, a leak will soon develop at the sill, causing rot and eventually calling for an expensive replacement. A better way to install the sash is to set it in a bed of mastic or calking compound in a narrow rabbet and secure it with a ⅛x¾-in. aluminum rim. The rabbet is then completely protected from moisture. Fasten the rim in place with ¾-in. No. 6 flathead wood screws on 2½-in. centers. The photograph shows the smart, modern look of the sash with its inconspicuous aluminum rim.—*G. B. T.*



Photos by Robert Brightman



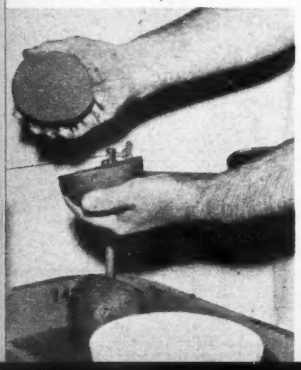
the modern potter's wheel

A new machine brings up to date one of man's oldest arts.

By John B. Kenny
Principal, High School of Industrial Arts New York City

PROBABLY the first machine ever invented by man was a device for turning a piece of soft clay while he shaped it with his hands, the potter's wheel, a machine which we know to be at least three thousand years old. Throughout the centuries

Process of preparing the clay by cutting it over a taut wire is called wedging.



Next step consists of fastening a plaster bat to the wheel head with three daubs of soft clay.

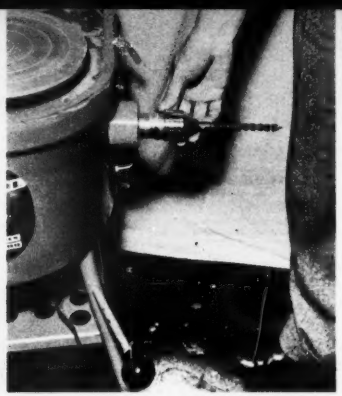
Then, while the wheel is in motion, a ball of clay is thrown against the center of the bat.

REMOVABLE ALUMINUM TRAY
ADJUSTABLE REST
WEDGING WIRE
ADJUSTABLE WATER BOWL
REVERSIBLE CERAMICS HEAD
BELT SANDER UNIT
40-160 RPM SPINDLE
600 RPM SPINDLE
STONE
WIRE BRUSH
BUFF
VISE, (TOP) ALONG WITH THREE OF SEVERAL DISKS USED IN LAPIDARY WORK - DIAMOND DISK LAP, AND SAND DISK
HORIZONTAL CONSTANT SPEED POWER SHAFT DELIVERS 1725 RPM
TWIST LOCK FOR SET SPEED
HAND CONTROLLED VARIABLE SPEED LEVER
GUARD
1/2" CHUCK
1/2" ARBOR
DRUM SANDER
ACCESSORY TRAY
HORIZONTAL VARIABLE SPEED POWER SHAFT (1100-1800 RPM)
ACCESSORY HUB
HEAVY DUTY AND PENCIL TYPE FLEXIBLE SHAFTS
ON-OFF-REVERSE SWITCH
ADAPTER
ADJUSTABLE CABLE
FOOT CONTROL FOR VARIABLE SPEEDS
STEEL TUBE LEGS IN RUBBER BOTTOM MOUNTS
PAINT SPRAY GUN AND COMPRESSOR MOUNT UNDER HOUSING

If the ball is off center, as it most likely will be, center it by hand as wheel is rotating.

Craftool is equipped with an arbor and idler; accepts standard abrasive belt for sanding.

A drum sander can be fitted to arbor at side or to shaft on top which drives platform.



Top can be lifted out for cleaning. Center picture shows how arbor can be used for horizontal drilling by equipping it with a chuck; or for grinding as at right.

while our civilization was developing, the potter's wheel remained in constant use. Slight changes were made in its design but essentially it remained the same. Potters continued to turn the wheel with their feet while they shaped a ball of clay with their hands. Today in industrial pottery making, foot power has been largely replaced by motor driven wheels.

Until quite recently potters' wheels have been large and clumsy, taking up a lot of space and requiring a special room for their use. Now, however, the home craftsman or the hobbyist who likes to work with clay can obtain a small power driven potter's wheel that is inexpensive and easy to operate. In addition it is portable and takes up so little space that it can be used in the average apartment and wheeled into a closet when not in use. The series of photographs accompanying this article shows such a wheel in use.

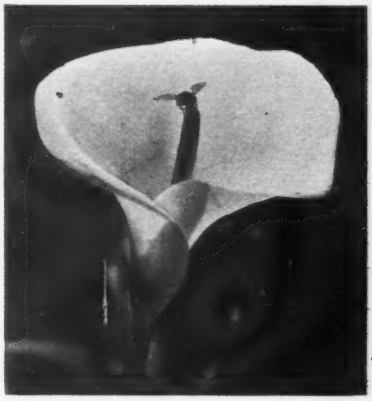
The process of shaping a piece of clay on a wheel is called *throwing*. The main steps in throwing a form are: preparing the clay; centering the ball of clay on the wheel; opening the ball; raising a cylinder; shaping and turning. When a form has been made, it must be allowed to dry after which two additional steps are required, glazing and firing. In the paragraphs which follow, we shall briefly describe each of these steps.

Preparing the clay. Before a potter starts to work on the wheel he must make sure that his clay is in proper condition. It must be plastic, quite soft and pliable to the touch, but not wet enough to be sticky and it must be of even consistency throughout. Clay purchased from a dealer in plastic form is usually just right for throwing, provided it is *wedged* first. Wedging is a method of mixing clay. A lump of clay is cut in half by passing it across a thin wire as shown. The two halves are then thrown, one on top of the other onto a plaster slab or a piece of unpainted wood. They must be thrown with force so that the two halves are wedged together forming one piece This piece is then cut into two halves and these are again slammed together and the process is repeated until the clay is thoroughly smooth with no air pockets and no hard lumps. The clay should be cut and wedged at least twenty times. To make wedging easy for the home craftsman, the potter's wheel described in this article has two metal uprights with a wire stretched between them.

A plaster bat. A potter can work directly on his wheel head but it requires a great deal of skill to lift a soft clay shape off the wheel without destroying it. For that reason most potters prefer to work on a plaster bat. This is a disk of plaster cast in an ordinary pie tin. Such a plaster bat can be fastened to the wheel head by pressing three lumps of soft clay against it as shown. The bat must be fastened securely so that it does not slip out of place during the throwing process, and it must be placed in the center of the wheel head. Concentric circles marked on the wheel head of this machine help the potter to get the bat in the proper position.

Centering. The potter forms his clay into the shape of a ball. He then starts the wheel and while it is turning, throws the ball of clay onto the center of the bat. The next step is to hold the hands against the ball of clay so that as the wheel turns the ball becomes centered. The potter wets his hands and braces his left hand firmly against the ball of clay while with the right hand he pulls the clay toward him. The object is to make the ball perfectly smooth so that as it turns it has no projecting bumps. The hands must be kept thoroughly wet at all times during this process and for that reason the machine provides a metal basin which is held in a [*Continued on page* 160]

Please put your name, address and picture-taking data on back of each print. Wrap with cardboard stiffeners and enclose a self-addressed stamped envelope or postage for return of unused photos. Prize-winning pictures are not returned. Judges are MI Editors. Duplicate prizes awarded in case of tie. Please address your entries to: Photo Contest, *Mechanix Illustrated*, 67 W. 44th St., New York 36, N. Y.



First Prize ($10.00) .....The Citadel
Taken by Stan Lee of N. Y. C. on a No. 120 negative. Note light from photoflood at top, left.

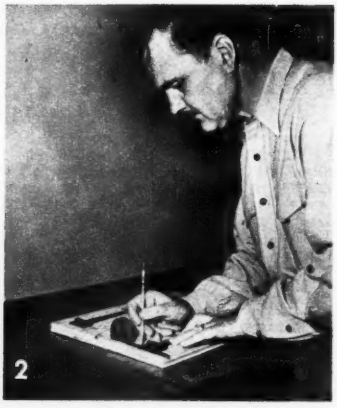
$5.00 Award .....Lunch
Gilbert Close of Hawthorne, Cal., used a 10 in. telephoto lens on a 4x5 Graphic to get this shot.

monthly photo contest

$5.00 Award .....Farmerette
By Dan Coleman of New York City; taken with a Rolleiflex on Ansco Superpan Press film; D-76.

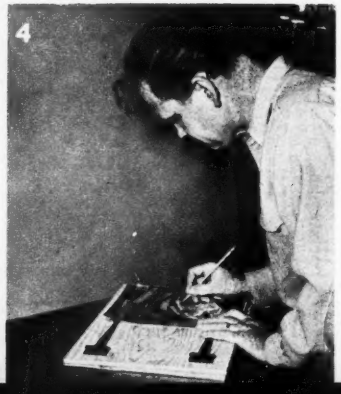
$5.00 Award .....*"Sez You!"*
A bit of back alley talk recorded by Esther deRoche of Passaic, N. J., with a No. 116 box camera.

Plywood Album



1. After cutting the ⅛ in. plywood to size, 12½x16½ in., carefully sand all the edges. The strip for the two hinges is 1½ in. wide.

2. The next step is to position the hinges and mark the screw holes with a pencil. Holes for leather thong should also be marked.



3. The holes for the hinges are drilled with a ⅛ in. bit. Use a 3/16 in. bit for the holes for the leather thong. Back up plywood with scrap material before drilling

4. An appropriate magazine cover can be used to help decorate the front of the album. Trace the design by means of carbon paper

By Shep Shepherd

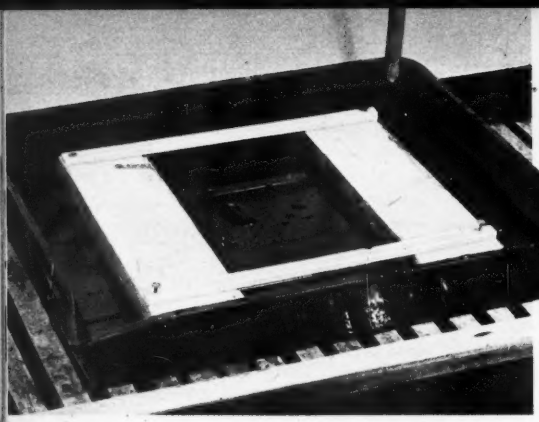
AN album is a must for the serious photo fan, for how else can he display his best snapshots without rummaging through a shoe box for that elusive picture which always seems to be misplaced. This album made of plywood is fully worth the effort which it takes to make. Its total cost is about three dollars. You'll need two pieces of plywood ⅛ or ¼ in. thick, 12½x16½ in.; two wrought iron hinges of the kind generally used on Early American furniture; a package of album or scrapbook paper and a leather thong or shoelace. From the best piece of plywood cut a strip about 1½ in. wide. This strip and the adjoining piece of plywood will form the hinged cover. Drill two holes in this strip to line up with the holes in the album paper allowing about ¼ in. for a protective overhang. Follow the photos—you can't go wrong! •

5. Use a wood burning tool to score the traced picture permanently into the cover of the album. Avoid embellishments.

6. The next step is to coat the wood with a wash coat of shellac. Use four parts of alcohol to one part of shellac.

7. Two nails are used as a guide to install the album pages and separator strips. Strips help keep album flat.

8. Final step consists of lacing the leather thong through album boards and paper. Arrows indicate thong holes.



Keep It Warm!

Left: One way of cooling developer in the summer time is by placing the tray within a larger tray of water, kept cool by a stream of running water from the tap. A wooden framework is used to keep the inside tray from floating.

"DEVELOP at 68°," advise all the photographic books. "If possible," is what they should add. What are you supposed to do if your developer is 88° or 48°? One extreme is as bad as the other. If the solutions are too warm, negatives usually come out very dense and contrasty; if too cold, the films turn out flat and underdeveloped.

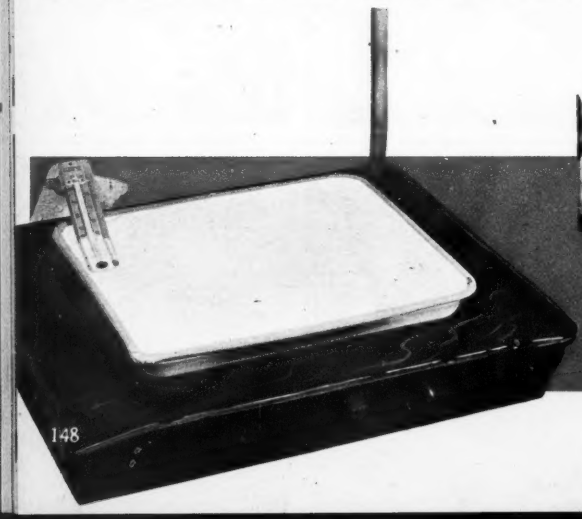
The easiest and safest way to adjust the temperature of an average working quantity of developer or fixer used for negatives (a quart or a half-gallon) is to place the whole bottle in a slightly larger tank or pot of any kind and to let cold or hot water into the latter. No matter how hot the air is, running water that enters a house through buried pipes is invariably much cooler. During the dog days of August, with the temperature 90° outdoors and 80° in my cellar, I find that twenty minutes of immersion in cold running water brings a quart of developer down to a comfortable 70°. The water itself measures a few degrees less. In the 10 or 15 minutes required for normal developing with standard developers, the solution temperature does not rise appreciably if a plastic tank is used, because the latter is a poor conductor of heat. Keep a thermometer in its neck and check it frequently. If the reading goes up slightly, reduce the developing time a minute or so. Be especially watchful if you use a stainless steel tank, as the metal is a good conductor of heat. Adjust the temperature of the short-stop and fixing baths while the film is developing. If all solutions are reasonably near the same figure, you will have no trouble with reticulation, the usual aftermath of hot, uneven processing.

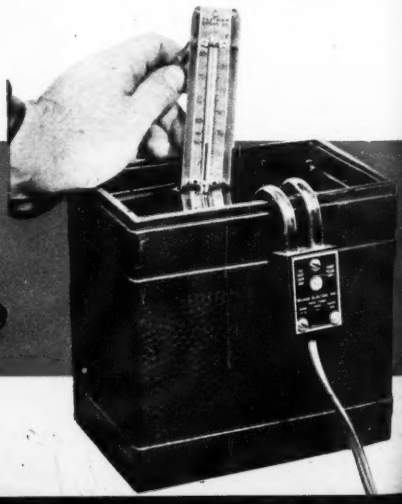
If your cold water isn't cold enough, put a few ice cubes in the pot to chill it. I said a *few*. They are around 28° as they come out of the refrigerator, and it doesn't take many of them to reduce a quart of developer from 80° to 70°.

Warming up cold solutions is a simple matter, because the water from any home heating system runs not less than about 120°, and usually closer to 160° or 170°. The tech-

A simpler method consists of merely floating the developer tray in a larger tray containing cool water. Make sure solution doesn't get too cool.

An immersion type heater used in winter for raising the temperature. It should be nickel plated or of stainless steel to prevent developer contamination.





Keep It Cool!

By Robert Hertzberg

nique is to mix hot and cold water in the pot to about 75°, before putting in the bottles of chemicals.

In the processing of negatives, the developer, short-stop, fixer and water are in and out of the tank in rather fast order, and do not have time to undergo serious changes in temperatures. In the processing of prints, however, the solutions remain in trays for several hours, and therefore require different treatment. While theoretically all the solutions should be of approximately the same temperature, only the developer, in actual practice, needs to be kept adjusted. In warm weather I pre-cool the short-stop and fixer in their bottles, using the pot method described; also, I submerge the short-stop and fixer trays in cold water in a wash basin for about ten minutes, to chill them. Then I drain the trays, pour in the respective baths, and pay them no further attention. The developer goes into a tray which sits in a larger tray in which cold water circulates. When making 5x7 or smaller prints, I use a 5x7 tray in an 8x10; for 8x10 prints, an 8x10 tray in an 11x14. Incidentally, the running water in the outer tray is fine for rinsing print tongs. A clip-on thermometer rests in the developer and I keep a sharp eye on it. Warm developer makes prints very difficult to control; the images almost jump up into your face, the shadows tend to fill in before the highlights have a chance to form, and contrast tends to increase.

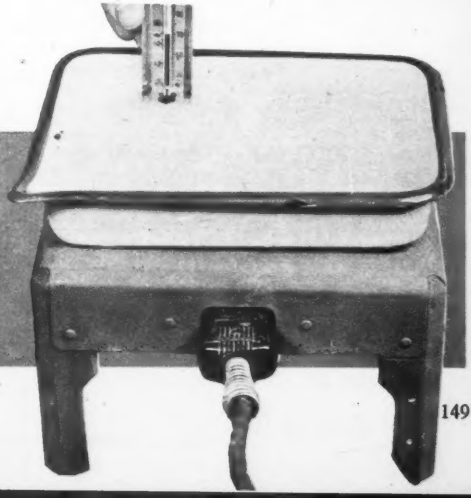
Transferring prints from 70° developer to 80° short-stop and fixer (the latter two warm up gradually to room temperature after their pre-cooling) doesn't seem to affect them in the slightest. I formerly used the double-tray arrangement for all three baths, but eliminated the last two after some cautious experimenting.

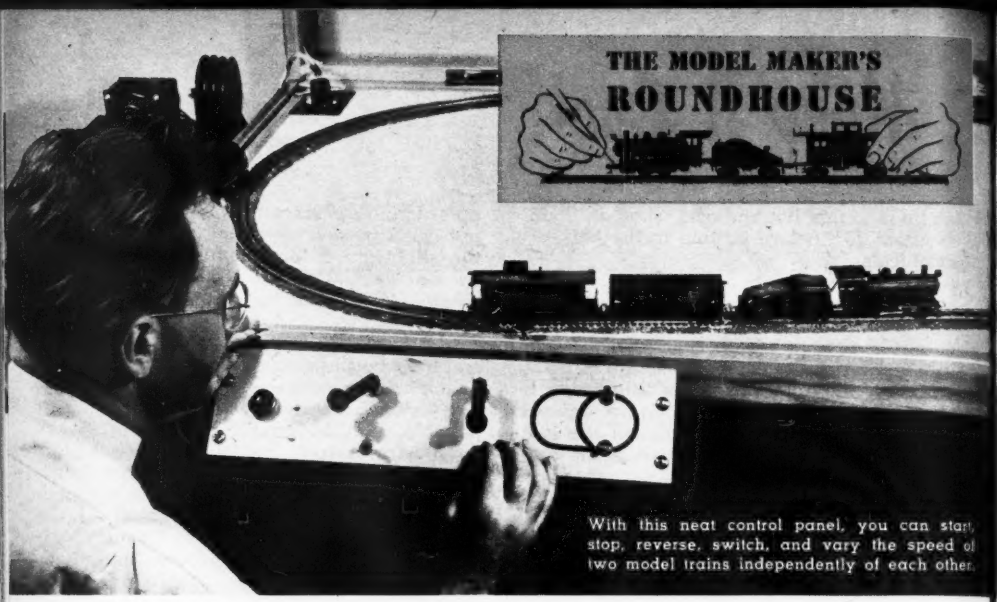
In cold weather I pre-warm the short-stop and fixer bottles and trays, and place the developer tray on an inexpensive little electric hot plate. This gives better control than is possible with hot water circulating in the double tray setup. Switch off the hot plate and it's off, but hot water remaining in the outer tray continues to warm up the developer even after you turn the current off. I use the hot plate eight or nine months out of the year. In a basement darkroom (and that's where most amateur darkrooms are) solutions sometimes measure 60°, 62° or 64°, just a little too low, even when the weather outside is fair and balmy. Two minutes on the hot plate is enough to bring them to good working temperature.

In all of the methods described herein, the cooling and heating of the liquids is accomplished indirectly. Nothing is put into the baths, and contamination is therefore avoided. However, for some purposes it is convenient to place a small immersion heater directly in a tank or tray. This is safe only if the heater elements are heavily nickel plated or, better yet, made of stainless steel of the grade known as 18-8. Rinse the heater thoroughly under running water after each use and keep it clean. •

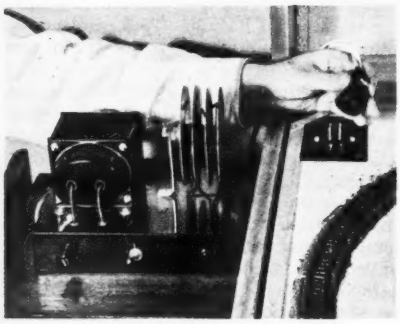
To heat or cool film developer, place in a large tank or pot and allow cold or hot water to flow into outer container until the desired temperature is reached.

An electric hot plate is ideal for keeping a tray of developer warm. Turn switch on or off as necessary in order to keep developer near the 68° mark.





With this neat control panel, you can start, stop, reverse, switch, and vary the speed of two model trains independently of each other.

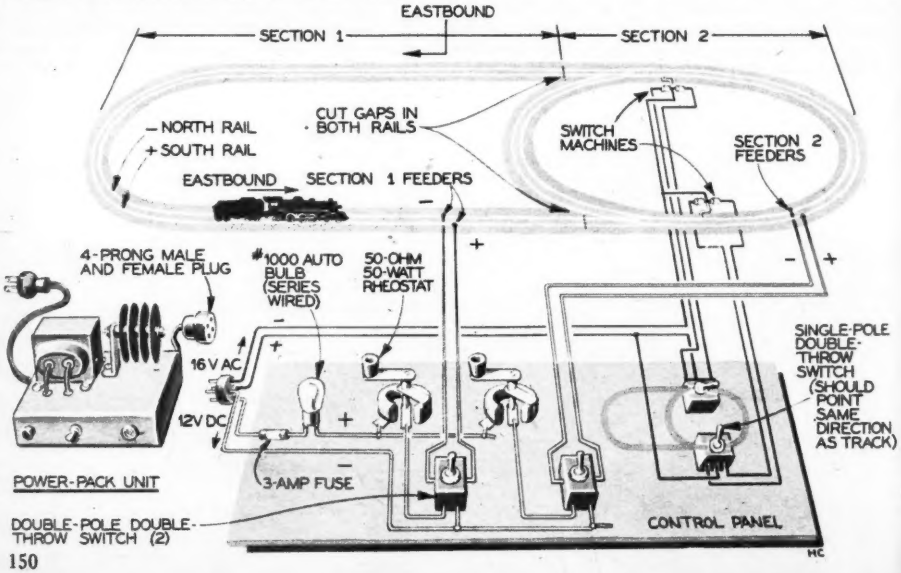


Connect the power pack to the control panel with a four-prong Jones-type outlet and plug.

Power Control Panel

IN THE May '52 issue of MI, Model Maker's Roundhouse showed how to build a simple power pack to reduce 110-volt AC to the 12-volt DC and the 16-volt AC you need to operate scale equipment. This month, let's put the power to work for us.

Every power system needs a controller. With it, we make our train go slow or fast, forward or backward. You will need a convenient connection to the power pack. One of the best connectors is a four-prong Jones-type outlet-and-plug set. Put the outlet at the end of a cable coming from the power pack and mount the [*Continued on page* 160]



The Plumbing System

[*Continued from page* 128]

operated fully opened or fully closed, as well as for contact.

There is another essential difference between the two types of valves. Globe valves are so constructed that the wearing parts can be readily replaced and considerable wear corrected by regrinding. With gate valves, however, it is not practical to reface seats or to expect new disks to hold in contact with worn or damaged seats. Worn or leaky gate valves should be replaced.

For these reasons, despite the friction loss, it is advisable to use globe valves in places where the valve has to be opened and closed frequently. If the use is relatively infrequent, the gate valve is preferable.

Valves, particularly on the hot water lines, are subjected to severe conditions. They should not be purchased solely on the basis of price. Valves of good quality will not corrode or stick, and will last as long as the house itself.

Plumbing in ranch-type homes must be given special consideration. If possible, fixtures and water-using appliances should be closely grouped around the utility-laundry room where the water heater is installed. This avoids excessively long runs of pipe.

Often this arrangement is impractical since the location of plumbing fixtures—in the last analysis—should be determined by convenience and accessibility. Under these circumstances it may be advisable to install a second water heater to serve the bathroom (or bathrooms) farthest from utility-laundry room.

In cases where a long run of pipe for hot water cannot be avoided, the use of a return line equipped with a circulating pump is recommended. Thus hot water will always be immediately available at the fixtures.

Most, if not all, piping is buried in a concrete slab in this type of home where it can be replaced or repaired only at considerable inconvenience and expense. This points to the importance of careful planning with respect to future water requirements.

All piping installed underground or buried in a concrete slab should be thoroughly tested before it is covered. The testing should be done with sufficient pressure so that there will be no probability of leaks developing later.

Selection of fixtures always is an important step in any home. Care and foresight should play a major roll in your choice. They should be picked carefully with due regard for quality and the reputation of the manufacturer, as well as for harmony in design and color. Unlike draperies, the fixtures can't be replaced at the slightest whim. Quality fixtures and economy go hand in hand.

Water heaters are available in varying sizes. In choosing one, the most important thing to consider is the number of household members it will have to serve. Its capacity must be large enough to meet future as well as immediate demands. Generally speaking, a 30-gallon automatic gas water heater is the smallest size to install for a family of two.

The best way to protect a water heater is by the use of properly installed pressure and temperature relief valves or combination pressure and temperature relief valves. This feature limits the pressure and temperature of the water to a safe range, thereby enabling the safety valve to open and relieve the pressure, should the water pressure exceed its predetermined maximum.

The automatic electric sump pump and the backwater valve are two devices that are invaluable in preventing flooded basements when spring rains fill the sewers. The sump pump is a small but dependable pump which is placed in the sump, or low point, of your basement. It starts automatically when water in the sump reaches a certain height.

Also available as a means of protecting basements against the reverse flow of sewage during heavy storms is an automatic backwater valve which closes when the sewer backs up. One type has a manual control as an additional safeguard if the automatic check valve should fail to operate.

If you live beyond the city water mains where you cannot draw upon the public water supply, electric water systems will solve the problem of running water. The electric water system not only brings running water into the rural home, but it makes possible all the city home conveniences which provide better and more enjoyable living.

An electric water system also offers fire insurance to the home beyond the city water mains. But this fire-fighting equipment must be supplemented with plenty of hoses and hydrants. Hydrant outlets should be located at strategic points. The power-driven pump should be capable of pumping 350 to 500 gallons of water per hour. The electric circuit for the pump motor should be installed so that current to the pump will not be cut off in case of fire.

As a final safeguard and convenience, piping in all home basements should be marked for identification purposes. This eliminates the possibility of mistaking one pipe for another in case of plumbing difficulties, and eliminates the danger of confusion on the part of family members in emergencies. •

[*Continued from page* 138]

of generators of varying output. The vibrating type current regulator operates with a two-brush generator, and while it serves to enable the generator to reach maximum current output at engine speeds that are low it puts a definite limit on the maximum output. Finally we have the combination type. This is interesting because the two vibrating regulators do not operate simultaneously. When the voltage regulator is in action the current regulator is idle, and vice versa. What the engineers aim for in this type of control is to provide maximum charging at low engine speeds while at same time holding output to a safe limit.

What happens to a regulation system when it fails to live up to expectations is quite a story. But far out ahead in interest is the fact that so much of what seems to be wrong with the electrical system has nothing to do with this much condemned unit. Pointing up this fact is the instruction sheet which accompanies one company's product: "Do not install this regulator unless you are sure that the old regulator is really causing the trouble." What the company wishes to underscore is the point that a lot of trouble in the system can be corrected without installing a new regulator.

All that need be done in many cases is to make sure the regulator is well grounded to the firewall. In other cases the trouble may be at the battery where a poor connection or a poor ground may be found due to a corroded ground strap.

Three abnormal conditions are found when trouble-shooting is definitely needed. First, there's the high charging rate when the battery tests fully charged. Second is failure to charge. Third is a low charging rate with a low battery. Checking is simple, and all you need is a piece of wire.

Before checking these conditions, however, touch the ends of the test wire to the posts marked GEN (or A) and B terminals of the regulator to polarize the generator. The engine should be switched off and the contact with the wire should be just momentary. Current then surges from the battery to the generator and the latter immediately matches the polarity of the former.

To check conditions one and two (no charge or too low a charge) start the engine and run it at the equivalent of a car speed of 25 mph. With your test wire make a temporary connection between the base of the regulator and a good ground. Naturally if this clears up the situation, the regulator merely needs better grounding. But if there is no improvement, and touching one end of the wire to the F terminal and the other to a good ground causes normal charging again, the regulator is due for junking. Should there be no normal resumption of current regulation, following the F to ground connection, try connecting your test wire between the GEN (or A) terminal and the B terminal. If the ammeter then can be made to show a satisfactory charge the regulator is on the sick list. But should there be no increase in charging you'll know that your real trouble lies in the battery, the generator itself or in the wiring.

It's quite simple to check into the reason for condition three—excessive charging. First run the engine for about 15 minutes at an equivalent car speed of 25 mph. Don't turn on any of the car's lights or accessories. Then just for a moment remove the wire from the F post of the regulator. If the regulator is out of whack the charging rate should drop back to zero. But if there is no such drop, look to the generator or wiring for your trouble.

It is necessary to use a voltmeter as well as an ammeter to check the exact opening and closing of the cutout and the regulator units (with the regulator on the car). This represents the critical check. It can be done successfully only by those who have had experience in this line. Adjustments are made on some regulators by loosening the contact mounting screws and raising and lowering the contact brackets. On other regulators changes are made by bending the arms.

Contact points need cleaning. This is done with the aid of a fine contact file, filing the points parallel with the length of the armature. They should be given a final cleaning with carbon tetrachloride, followed by pulling a clean linen tape between them. Factory instructions warn against using emery cloth or sandpaper for point cleaning.

Finally, there are a few rules that should be observed by anyone replacing a regulator. First, fasten it to the firewall before making any connections. Connect the wire to the ground terminal first and the wire to the F post last. This prevents reversing polarity, a common reason for failure of a new regulator. Another important rule is to disconnect the F wire first and the ground last when removing the old regulator.

Regulators are fussy gadgets at best. But they certainly do a most effective job when they have the benefit of a little help. Typical is the rule to make certain you do not accidentally touch the BAT wire to the ground terminal. That would damage the regulator. So would letting the metal cover touch the regulator parts, thus inviting a short. •

The Amateur Telescope Maker's Page

Pictures Through a Telescope

This garden sundial was photographed with a 4x5 camera using a standard 5½ in. lens. The exposure was 1/50th of a second at f-16 on Super XX film.

HAVE you ever looked through a telescope and said to yourself, "Boy, I sure wish I could take a picture of this." Well, you can. Taking pictures through a telescope is not at all difficult. Any camera equipped with a ground glass back can be used by removing the lens and lensboard of the camera as well as the eyepiece of the telescope and using the main lens of the telescope as a long focus lens.

Both photographs of the sundial reproduced on these pages were taken in the gardens surrounding Eastman House in Rochester, N. Y. through a telescope built by Ralph Dakin of Pittsford, N. Y. The top picture shows the appearance of the sundial taken with a 4x5 camera using a standard 5½ in. lens. The second picture shows a magnification of approximately four times achieved by using the objective of the telescope as a taking lens.

To take a picture, place the camera as close as possible to the eyepiece adapter of the telescope. In fact, if at all possible the eyepiece adapter should be located within the bellows of the camera. In the picture at the top of this column a prismatic diagonal was left on the telescope so as to make focusing more convenient. The camera of course should be in exact optical alignment with the telescope. A sturdy tripod for each instrument is a must. [*Continued on page* 186]

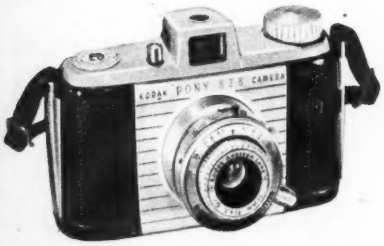
The same sundial photographed from the same spot through a 20 in. refractor telescope. Camera lens and eyepiece of the telescope were removed.

Photos by Dan Rubin

Picture it in full color... and see the difference!

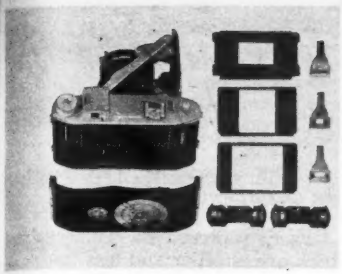
Now it's so easy with a fine Kodak miniature camera. COLOR makes the difference. It's the only way to catch the warmth of an autumn field, the flash of hunter red, the majesty of blue sky. And the wonderful part is that taking color pictures requires no more effort on your part than a black-and-white shot.

Today it's so easy to enjoy color pictures with reasonably priced miniature cameras and viewing equipment. You see two camera examples on this page. And on the facing page are camera accessories and projection equipment. Be sure to inspect these at your Kodak dealer's. He will supply you with everything in the way of color.

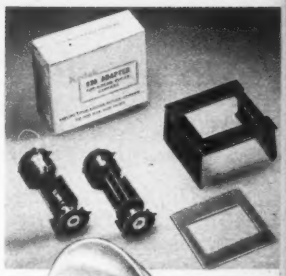


Thrifty color "miniature"—The Kodak Pony 828 Camera makes superb color slides on Kodachrome Film; sharp black-and-white negatives; gorgeous Kodacolor snapshots. Kodak Anaston *f*/4.5 Lens (Lumenized). Flash shutter with speeds to 1/200. Takes 8-exposure rolls. $31.15. The "Pony 135," for 20- or 36-exposure 35mm. film, has automatic film-stop and exposure counter. $35.75. Kodak Flasholder for both cameras, $8.25.

Precision range-finder "miniature"—The Kodak Signet 35 Camera boasts the world-famous Kodak Ektar Lens (*f*/3.5). With this fine lens you can do salon-quality color work . . . get sharp, brilliant color slides, for projection or for color prints, with Kodachrome 135 Film; also sparkling black-and-whites. The "Signet" has coupled range finder; feather-touch shutter release bar; speeds up to 1/300; built-in flash synchronization. $92.50. Flasholder, $8.25.

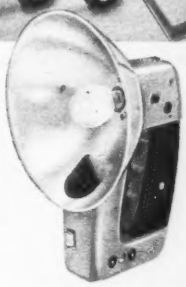


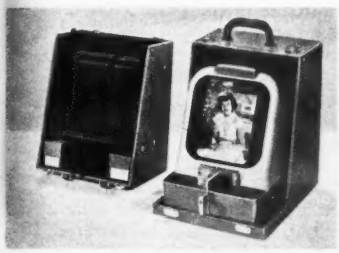
Inexpensive adapter kits permit use of Kodachrome Film with Kodak Tourist and Reflex Cameras—Kodak Tourist Adapter Kit, $13.25 (*left*), for deluxe model "Tourists," and the Kodak 828 Adapter for Kodak Reflex cameras, $4.59 (*right*), let you take pictures in full color on Kodachrome or Kodacolor 828 Film. "Tourist" kit also permits economical half and square pictures on all Kodak 620 films.



Get in the picture yourself with a Kodak Auto-Release (for any camera equipped with cable release). Delays shutter action. $3.86.

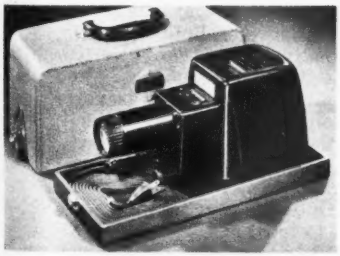
New, dependable battery-condenser flash system — The revolutionary new Kodak Ektalux Flasholder gives positive flash performance. Secret: condensers store power from 22.5-volt photoflash batteries until needed . . . fire lamp in a single surge far more powerful than the force of the usual battery. With Standard Bracket, $29.75; with Press Bracket, $33.85; with Bracket for Polaroid Land Camera, $30.60.





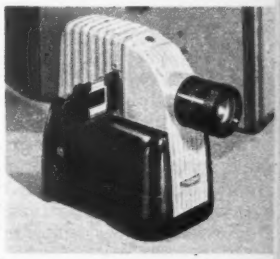
For deluxe small-group showings—The Kodaslide Table Viewer, Model A (*left*), combines projector, screen, slide changer in one unit. Takes 75 cardboard or 30 double glass slides. $97.50. Carrying case, $27.50.

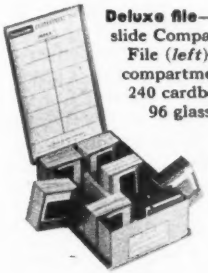
Inexpensive table viewer—Kodaslide Table Viewer, 4X (*right*), enlarges slides more than four times on built-in screen. Images are bright and clear even in a lighted room. $49.50. Carrying case, $15.50.



Budget-priced slide projector—Kodaslide Merit Projector (*left*) features new jar-proof slide feeding. Brilliant 5-inch *f*/3.5 Lumenized lens; built-in elevation device; cool operation. $26.10. Carrying case, $9.50.

King of them all — 1000-watt Kodaslide Projector, Master Model (*right*), delivers screen images of unprecedented brilliance. Ideal for large-group showings. Choice of 4 lenses. From $169.00. Carrying case, $50.





Deluxe file—Kodaslide Compartment File (*left*) has 12 compartments for 240 cardboard or 96 glass slides. $3.94.

Inexpensive protection for slides—Kodaslide File Box (*right*) keeps them organized. Holds 150 cardboard or 53 glass slides. $1.57.

For mounting transparencies in glass—Kodak Slide Kit contains everything you need—glass for covering transparencies, masks, binding tape, and tabs for 50 slides. $3.63.

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Kodak

TRADE-MAR

Cement—How To Use It

[*Continued from page* 125]

construction the first step is to prepare the base. If well drained, compact the soil and place the concrete directly on it. Otherwise dig out for a 4 to 6 in. sub base of clean cinders or coarse gravel compacted firmly. Side forms can be made of 2x4's; the top edges can then be used as rails for the strike board. Low stakes hold the forms in place while pouring the concrete. A pitch of about ¼ in. to the foot should be adhered to for good rain drainage. To provide for expansion, use partition strips at right angles every 4 to 6 ft.

Garden walks can be of stepping stones or the flagstone type. For stepping stones, irregular holes are dug and used as forms. Concrete is placed in the hole, smoothed and allowed to cure. For color, mineral pigments are added to the mix.

Steps and porches are simple to construct and last indefinitely. In planning, check for safety, appearance and comfort. The tread should be wide enough and the rise sufficiently low so as not to present any hazard. Follow the drawings. Two inch lumber should be used for the sides, backed up by cleats and stakes and rigidly braced. Check the riser forms for rigidity, they may bulge if not adequately braced. Use a firm concrete mixture, one that is not too wet. Pour one step at a time, tamping carefully. After about a half hour, when the concrete has begun to stiffen, level off the steps and finish with the wood float. The edging tool will round the tread.

Timely patching will restore a damaged floor or cracked sidewalk and provide additional years of service. A few simple pointers mean the difference of many years in the life of the repair. The area or crack must be roughened with a chisel and cleaned. The edges should be undercut. Wire brush the surface and wash away the particles with clean water. Remove any excess water on the surface, leaving the patch damp. Brush on a thick creamy mixture of the cement and water. Mix a stiff mortar, one part cement to three parts of sand. Let it stand for thirty minutes, mixing occasionally. Tamp this mix firmly into the cavity and smooth off with the wood float. Finish with the steel trowel or float.

Never permit fresh concrete to dry out. Do not remove the forms for at least a week. Keep the work covered with straw or canvas while the concrete is curing. Protection from sun and wind will allow the concrete to gain maximum strength. When properly handled homemade concrete construction meets all requirements of utility and appearance and it is as pleasing to the eye as that apple pie hot from the oven. Just follow the recipe. •

Roof Over Your Head

[*Continued from page* 117]

eaves, which are advisable for any type of roof.

Shingles in one form or another are the commonest roofing material for pitched roofs. Wood shingles, formerly universally used, have now been largely replaced by asphalt strip shingles, which are cheaper and less inflammable. Asbestos cement, slate, and tile are also occasionally used, but they are expensive and they are also heavy; so before using any of these materials, make sure that the rafters are strong enough. Shingles cannot be used on roofs of lower pitch than 4 in 12.

Metal roofs are also extensively used. Copper is the best metal, but it is quite expensive. Galvanized iron and tin-plated iron are widely used, and aluminum is now coming into use. On roofs of average steepness, standing or batten seams are used to join the sheets. On roof pitches lower than 3:12, flat soldered seams are used.

Roll roofing is the least expensive of all roofing materials. For temporary or utilitarian building, the type with only a 2-in. lap can be used, but for a house the best type is the "split sheet," which is designed to lap half of its own width, or about 18 in. The exposed half of the sheet is mineral surfaced. The roofing is applied parallel to the eaves and nailed through its upper half, which will be covered by the next course. This type of roofing can be used for roof pitches as low as 2 in 12.

For flat or nearly flat roofs, built-up roofing must be used. This type consists of alternate layers of roofing felt and hot asphalt or pitch. The top layer is often covered with gravel to protect the asphalt from injury by the sun.

A completely flat roof can be designed to carry a shallow pool of water for insulation from the summer sun. Water is very heavy, so check the strength of the roof framing carefully if you plan to have a pool. A more effective type of summer cooling, and one that can be used with any type of roof, is a spray designed to keep the roofing material constantly wet. The evaporation of the water from the roof will lower the temperature in the house perceptibly. Wood shingles are ideal for this type of cooling. Incidentally, a white roof will reflect the sun's heat effectively and will produce a noticeably cooler house.

No less important than the roof itself are the joints where chimneys and vents come through the roof. These joints must be flashed with metal, which should be preferably in two pieces so that it will not be disrupted if there should be any movement between the parts of the house such as might result from normal shrinkage or settlement. •

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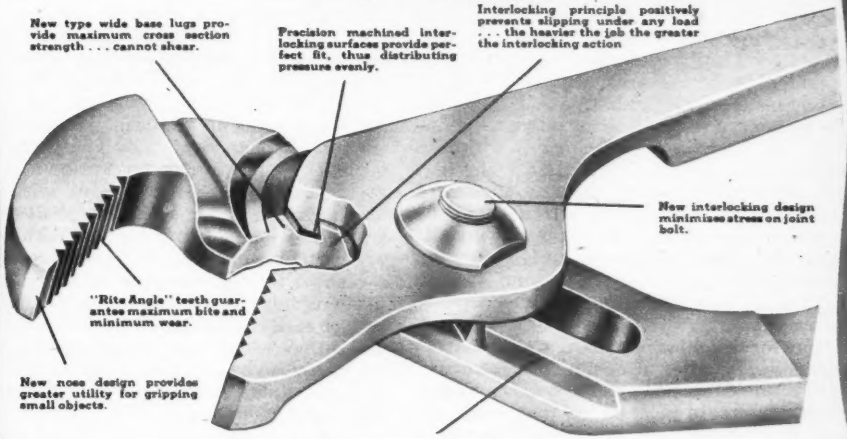

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Space Saving Partition

[*Continued from page* 131]

principal features of the partition. Make the base of 2x3s nailed together and nailed to the floor. The cabinet flooring is ¾-in. stock. It should be cut to the same outside dimensions as the base, to which it is nailed. All shelving should be installed while the framework is being assembled. Since the shelving for the bookcase compartment is narrower than the desk compartment, there is a jog in the ⅜-in. plywood middle partition. The shelves are set in dadoes and secured with glue and finishing nails.

Note that the upper rails on the two sides and outside end are rabbeted for the ¾-in. plywood top and that the latter laps the end piece that goes against the wall. Secure the rails and stiles to the shelving and the end pieces with set-and-puttied finishing nails. The plywood top is also installed with finishing nails. Build the desk unit to fit into its compartment snugly without forcing, making it ¼ in. undersize on all three outside dimensions. No back is needed since it fits flush against the compartment partition. The unit is simply slipped into place without nailing. The drop-leaf writing shelf is hinged to the lower shelf of the compartment before installing the unit. Two lengths of brass chain should be installed. Attach the upper end of each length to a screw in the unit to give adequate writing support.

Doors for the china cupboard are made from 1x6-in. panels after checking the measurements of the cupboard openings. Cut a tongue along each end of each panel, then bevel the outer face of each panel. Groove the door stiles for the panels and assemble the doors with dowels and glue.

If desired, an attractive carved design can be worked into the top panel of each door. Rustic hinges and handles will enhance the appearance.

The open shelving mounted on top of the cabinet is an adaptation of a Chinese design technique. Dimensions specified should be followed quite closely after checking the exact distance between the ceiling and top of the cabinet. The vertical members of the interior pattern are placed so that each upper member is in direct line with a lower one. This same principle should be observed even if the design is altered. Rabbet the members and assemble by gluing and nailing together. The section can be assembled in the shop with the exception of members X and Y, which are inserted after mounting the rest of the assembly on top of the cabinet. Secure in place by nailing into a ceiling joist and toe-nailing into the cabinet. •

Your Floors

[*Continued from page* 120]

If unfinished flooring is chosen, you can finish it yourself. A smooth sanding job is a must. Many hardware and lumber companies rent sanders. The amateur should remember to cut with the grain. No. 2½-30 sandpaper is recommended for the first cut; No. ½-60 for smoothing the high spots and joints; and No. 00-100 for the final cut.

The floor should be swept or vacuumed immediately after sanding and the finish should be applied before the grain has a chance to raise. A penetrating finish is more satisfactory than a surface finish such as varnish or shellac.

Asphalt tile is perhaps the most firmly entrenched of all the new flooring materials. The asphalt-tile salesman has several good talking points. In a basementless house with 1,300 sq. ft. of floor space, the use of asphalt tile saves from eight to ten floor joists as well as subflooring for the entire area. In addition to this, the concrete slab and asphalt tile run no risk of being on the termite menu. Asphalt tile costs little to install and it comes in a wide variety of colors and patterns. However, there are several points on the debit side. Grease and sugar are detrimental to asphalt tile; it is scarred by heavy furniture; and with the best of care its life expectancy is less than 20 years.

Rubber tile has many attractive features. It deadens noise, is warm and flexible underfoot, and is easily maintained by soap and water and an occasional coat of self-polishing wax. Its chief drawback is that it cannot be successfully installed in basements or any other areas below the ground.

Familiar linoleum has come a long way since it was first used in the kitchen. Modernistic black and white squares are seen in the living rooms of some of the most expensive houses. Splatter patterns are used in Colonial bedrooms. It comes in rolls 6 ft. wide or in room-size rugs and can be applied to any wood or concrete that is not in direct contact with the ground.

Cork makes a satisfactory floor because it cushions noise and is resilient. It comes in a variety of patterns including strips, squares, and rectangles.

Terrazzo, slate, flagstone, and ceramic tile are all flooring possibilities, but are more suited for terraces and public buildings than for residences. How do these flooring materials compare in cost? Hardwood costs from $6 to $8 per square yard, completely installed. Vinyl plastic is a little over $4 a square yard. Rubber tile is around $5.50 a square yard. But the initial cost is not the only thing to be considered. Frequency of replacement and cost of maintenance are also vital factors. •

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The Model Roundhouse

[*Continued from page* 150]

plug on the control panel or anywhere conveniently near it. Use pins No. 1 and 4 for DC and No. 2 and 3 for AC.

The drawing shows a typical elementary track plan that you can expand later if you want to. It's sectionalized so that you can run two trains on it independently of each other. You can apply the principles used in wiring this layout to any you design yourself. Call the left-hand part Section 1 and the right-hand part Section 2.

On your control panel, the first thing needed is double protection from overloads—a No. 1000 auto headlight bulb backed up by a 3-amp. push-to-reset circuit breaker or a 3-amp. fuse. Connect wires to the two terminals on the base of the bulb. Under normal operating conditions, the resistance of the filaments is less than ½ ohm and has no effect on current flow. When you get a short circuit, the filaments become hot and the bulb lights up. The circuit breaker backs the bulb up, and opens only if the short persists. (If you are operating an O-gauge layout, you will need two bulbs in parallel.)

Next, you need speed control. You get it with two rheostats, one for each section. If there is no railroad hobby store in your vicinity, get 50-ohm, 50-watt rheostats from a ham radio store. (For O gauge, use 20-ohm, 50-watt ratings.) When you mount the rheostats on the control panel, label each to show which section of track it controls. Mount rheostats on the left side of panel so that you can operate them with your left hand.

Another thing your unit must do is control direction by reversing the polarity of the direct current supplied to the track. This is done with a double-pole, double-throw toggle switch for each section. Mount these switches on the control panel, each under its section's rheostat. Wire them so that the toggles point east when your south rails are positive. That way, when the current is off you can tell by looking at the switches which way the train will go when you turn on the juice.

Connect the center terminals of the switches to the rails with feeders made of at least No. 18 and preferably No. 14 stranded wire. Solder the wires to the sides or bottoms of the rails to get good connections. Connect the feeders in the position shown. Cut gaps in both rails—the kerf of an ordinary hack-saw blade will do.

If you want to wire the alternating current through the control panel, you will find one more switch useful—a single-pole, single-throw to turn the current on and off.

—*Andrew Takas* •

Modern Potter's Wheel

[*Continued from page* 144]

bracket. This can be adjusted to any position to suit the potter's convenience.

Opening. When the clay has been centered, the potter grasps the ball with both hands, puts his thumbs together and presses downward in the center. This makes the clay take the form of a low shallow bowl with thick walls. The potter must be careful not to push his thumbs down too far for if they touch the bat it will mean that the piece he is forming will have no bottom. A thickness of about a half-inch must be left.

Raising a cylinder. After the ball of clay has been opened the potter makes the wall thinner and taller by squeezing it between his two index fingers. He puts his left hand on the inside of the piece and his right hand on the outside. By bringing the index fingers of his two hands closer together he forces the clay upward. As he raises his two hands, if he keeps the distance between his index fingers the same, he makes an even wall.

Shaping. Once a cylinder has been formed, the potter can produce almost any shape he wishes. Pressing outward on the inside of the lower portion of the wall will form a round, bowl-like vase shape. By pressing inward at the top, the potter can make a narrow neck. In the large picture, the potter, using the index fingers of both hands, brings the top of the cylinder outward to form a flaring lip.

Turning. During the throwing process the potter can shape the sides and the top of the piece he is making, but the bottom which rests on the bat remains rough and unfinished. To work on this portion, the potter must wait until the clay has dried slightly and reached what is called the *leather hard* state.

Firing. After the shaping of the clay has been completed the piece must be allowed to become thoroughly dry. This may take two or three days. When it is bone dry, the piece is ready to put into a kiln for its first, or bisque firing. (The construction of a kiln was described in last month's issue of MI.) In the kiln the piece is heated well beyond red heat to a temperature of about 1900°. It usually takes from six to ten hours for such a firing and after the temperature is reached, the kiln is turned off and the piece is allowed to remain in the kiln so that it can cool slowly for another 24 hours. When it comes out of the kiln, it is what potters call *bisque*.

Bisque ware, while dense, is still porous and not suitable for holding liquids. In addition the surface lacks color. To remedy these defects the piece must be glazed and fired once more. Prepared glazes can be purchased from dealers in ceramic supplies. •

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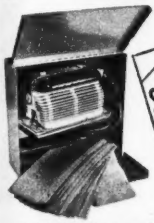
Price includes this sturdy steel storage case (shown below) with handy carrying handle; 25 assorted abrasives; 1 sheepskin pad. **$24.50**



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NEW sleek, smooth lines
NEW hydraulic front fork
NEW big, 8" front and rear brakes
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NEW rugged, double-loop frame

Predict Your Own Future

[*Continued from page* 63]

omniscience, attacks the phonies mercilessly. But she declared: "We can better our lives by studying hands and many times we can see what could happen."

She told a strange story. Studying her late husband's palm, she detected a strong life line but later investigation showed a split starting to develop. She watched it grow—soon an island developed. This, in the language of palmistry, was a foreshadowing of doom.

Seven years later, her husband died of cancer.

Alfred Hitchcock, the famous movie director, relates a weird experience with a gypsy crystal gazer in Hastings, not far from London. Horror gripped her as she gazed into the globe—and Hitchcock sat transfixed as she told of a terrible catastrophe that was to occur at exactly 6:07 that evening. She exhorted him to be careful, because she foresaw a fatal accident, even heard a fearful shriek.

Unnerved, Hitchcock returned to his summer home and when six o'clock neared, went into his study. The clock ticked off the minutes with agonizing slowness. Minute after minute went by and finally the fateful time arrived.

Silence. The clock ticked on and the silence continued. At ten minutes past six, Hitchcock rose from his chair, sighing deeply. Nothing terrible had happened—he laughed at himself for even half-believing.

Next morning at breakfast, a headline in a newspaper caught his eye. A woman had been killed in a scenic-railway accident at an amusement park. A horrified onlooker had shrieked a warning, but too late. The time had been exactly 6:07. The victim? The gypsy crystal gazer!

Those are the arguments pro and con—but now let's look at the specific fortune telling methods. How do the oracles forecast what's going to happen—what are the keys they use to open the doors to the shadowy Dimension X?

Let's look at palmistry. It's steeped in antiquity—the Chinese practiced it 3,000 years before the birth of Christ; it was highly esteemed by Aristotle and the ancient Hindu wizards. It is still regarded as an exact science by many persons in China, India and the Arabian world.

[*Continued on page* 164]

It's an "All-American" beauty . . . a streamlined flash of color that begs to be ridden. Straddle the "K" and you'll marvel at the comfort of the cushioned twin-post saddle . . . the hydraulic telescopic fork . . . and the swinging arm rear suspension. You'll smile big and bright when you "kick 'er over" and this all-new power plant responds with that steady, smooth throb that promises more thrills to come. And when you flick it into gear and give it the power — you're off and away on the most exciting ride you've ever had. Ride it! Try it at your dealer's today. Bring a buddy along. Or send 25¢ for illustrated literature and a copy of the Enthusiast magazine, filled with action pictures and stories. HARLEY-DAVIDSON MOTOR CO., Dept. MI Milwaukee 1, Wisconsin.

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Predict Your Own Future

[*Continued from page* 162]

Basically, palmistry says that an individual's character, past and future, can be judged by the lines upon his hand.

Hold up your hand; let the fingers relax slightly so that the lines are well-defined. You will find three main lines—the life line, which starts halfway between the base of the first finger and the thumb and curves toward the wrist; the head line, which is the lower of the two horizontal lines in the center; and the heart line, the upper one.

If the life line makes a wide circle around the thumb and extends almost to the wrist, a long life is in store; if it is short, life will terminate prematurely. Don't despair, however—palmists tell you that many other signs may modify or alter this. Breaks in the life line indicate illness. If it is thick and thin alternately, it denotes ups and downs in success. A fork in the middle means long journeys are in prospect and a netted line warns you to conserve your energy by lots of rest.

The longer and deeper the head line, the more brain power the individual possesses. A short, clear one or one which is faint shows flightiness. And if there are islands in its midst, you're in store for nervous troubles.

If the heart line runs within a half inch of the fingers, it means jealousy. A short heart line indicates a selfish nature while a broken one means just that—you will be unlucky in love.

There are many other subsidiary lines, crosses, stars, grills, nettings, all of which are supposed to tell a story.

The reading of tea leaves is another ancient practice, stemming back to China in the days of the historic dynasties. Unfortunately, the habit of using tea bags has dealt this practice a severe blow—it can only be done with tea made the old-fashioned way.

After all but a few drops of the tea have been drunk, the tea cup is inverted on the saucer for a minute, then righted. The tea leaves are left scattered around the inside of the cup from the rim on down. Look closely and you will see that they have taken on many odd shapes and each pattern has a specific meaning. You need quite a bit of imagination to interpret the forms, but the experts do it readily.

If you see a shape resembling a tent, it means a long journey is in prospect. A sword indicates a minor misfortune lies just ahead while a ship is a sign that a journey will be successful. A horn reveals prosperity, but a knife means you will shortly have a bitter quarrel with some one. See a cross? You're

[*Continued on page* 166]

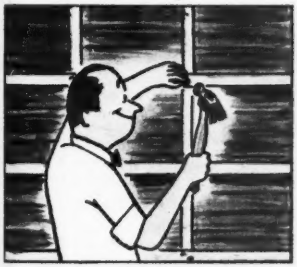
HOW TO "TRADE-IN" YOUR OLD ATTIC!

It's easy with Gold Bond Insulation Board!

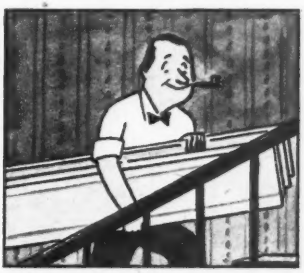
Clear the decks for action! Find someplace else for the trunks and "heirlooms" that clutter up your future attic room.

Measure attic walls and ceilings. This will tell you how much material you'll need . . . also determines where to nail furring strips.

Take measurements to your Gold Bond Dealer. He'll show you factory-finished Gold Bond Insulation Plank and Tile in harmonizing colors.

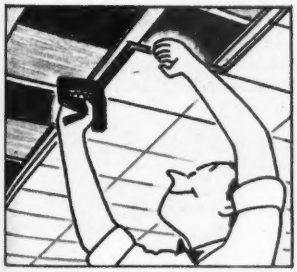


Nail up furring strips—ordinary 1" x 3" wood strips that anybody can handle. This gives you a stapling surface for Gold Bond Plank and Tile.



Gold Bond Insulation Plank and Tile are lightweight. The Plank comes in four widths starting at 8". Tile is packaged in several sizes.

Interlocking beveled edges fit together quickly and easily — hide staples or nails to give a neat, good-looking job.



Even the ceiling is a cinch . . . when you use Gold Bond Insulation Tiles. No heavy lifting — anyone can do it.

Before you know it, a brand-new room! Pre-painted Gold Bond Insulation Board builds and decorates—*insulates* and *quiets noise*, too.

ADD-A-ROOM NOW!
with Gold Bond

NATIONAL GYPSUM COMPANY
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. . . makes YOU a Wizard with Wood

Handy with your hands? Is making things your hobby? Like to do odd jobs? You'll bless the day you discovered the magical results you can obtain with Weldwood Glue, Firzite and Satinlac. At hardware, paint and lumber dealers. Mail coupon for free leaflets.

Gets that blond or pickled effect—

Produces those magical "woodsy" effects—on hard wood or soft, plywood or solid lumber. For light pastel tones, tint White Firzite with Colors-in-Oil. (On fir plywood stain jobs, tame that wild grain with Clear Firzite.)

WHITE FIRZITE®

Gets that Natural-Wood Finish

—*without shellac or varnish.* On furniture, panelling or woodwork, there's nothing like Satinlac. Brings out natural grain and color beauty of any plywood or solid wood. Avoids that "built-up look; will not turn yellow or darken with age. "Water-clear," easy to brush or spray, dries ready for next coat in 2 or 3 hours.

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The Wood Glue you can rely on!

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Predict Your Own Future

[*Continued from page* 164]

going to hear some bad news. A butterfly? Your girl friend is going to prove fickle. A clock? You're going to meet someone who will have a strong influence on you. A bird with wings outstretched? Good news is heading your way. A clover? You will prosper and be happy.

A ouija board is supposed to spell out answers to questions about the future and receive messages from the dead. It is a highly polished slab of wood a little less than a yard long and about a foot and a half wide, with the letters of the alphabet inscribed, usually in two rows. A much smaller three-legged table, about an inch or two high, rests upon it. Near one end a pin protrudes.

Two persons sit with the board resting on their knees, and place their finger tips on the three-legged table. Then one concentrates on a question. If the concentration is deep enough, the table is supposed to move slowly until the pin is directly over a letter of the alphabet. It moves again, until the answer has been spelled out.

What makes it work? Ouija board enthusiasts insist it is directly by spiritual emanations which cannot be explained in mortal terms. Psychiatrists say it's probably the unconscious of the people involved, however.

Sand divining is a Middle East specialty, used only occasionally by U. S. fortune tellers. Several inches of sand are placed in a tray, a question is asked and the fortune teller sits blindfolded, a sharp stick poised over the tray. When the spiritual impulse comes, he dips the stick into the sand and lets it move about of its own free will. The design thus formed is the key to the future.

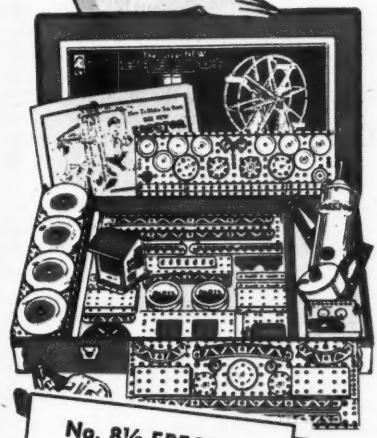
There are even some fortune tellers who help persons decide problems with dice. But not on Mondays or Wednesdays—it's unlucky to try on those days. Three dice are shaken in a cup and thrown onto a chalked circle on a table. The total numbers have meanings, as follows:

3. a pleasant surprise
4. an unpleasant surprise
5. a stranger is coming into your life
6. prepare to lose something
7. a scandal is near
8. you will be unjustly blamed for something
9. a wedding nears, maybe your own
10. a christening will be held soon
11. a large legacy is in store
12. an important letter on way
13. you will weep soon

[*Continued on page* 176]

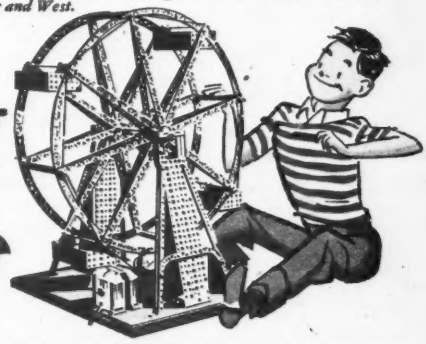
Hey, Gang! Get an ERECTOR®

and you have your own TOY FACTORY!



Open your new Erector Set and feast your eyes on the dazzling array of precision-made parts! What thrilling times you'll have building dozens of gigantic engineering marvels! There's more excitement when you turn the switch of Erector's powerful electric engine and your models come alive. Only an Erector Set makes possible models that blaze with lights—whistle—puff smoke—go choo-choo-choo—operate by remote control. Christmas is just ahead—so show this ad to Dad. Erector prices start at $2.00. *$2.10 Denver and West.*

No. 8½ ERECTOR
All Electric Set. Over 15 POUNDS of parts — including electric engine with 4 speeds — lights — electro-magnet — Flex-O-Matic coupler. Makes over 100 action models. Price $23.50. $24.50 Denver and West.



GIANT FERRIS WHEEL. Turns in either direction—fast or slow. Make it with No. 8½ Erector.

World's Greatest Construction Set!

Famous true-to-life SQUARE GIRDERS—won't bend, twist or wobble. Exclusive with Erector!

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Towers 5 feet high. Chutes float down automatically when they strike top. Make it with No. 10½ Erector.

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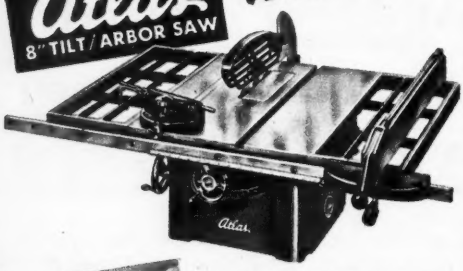
Every Time You Use It...

YOU'LL VALUE ITS CAPACITY AND VERSATILITY!



SPECIFICATIONS

Max. Depth of Cut.....2⅛"
Table Ahead of Blade.....10¾"
Rip to Center of.....19" panel
With one extension.....36½" panel

1 — Shapes

2 — Cuts tapers

3 — Dadoes

Saving you time, money and improving work accuracy *every* time you rip or crosscut a board to size is *just the beginning* of this saw's usefulness.

It handles easily and accurately such sawing operations as cutting angles, double angles, chamfers, bevels, tenons. And with low cost Atlas accessories it cuts all dadoes...handles a host of straight shaping and moulding operations.

Atlas is *the* saw for your shop. Its double-locking patented fence is the best you'll find on any saw. Blade tilts—your work stays flat—for safe accurate angle sawing. Has sealed-for-life ball bearings. Precision-ground grey-iron table. Grill extensions, original with Atlas, for handling big stock. See these and many other features at your Atlas dealers, or send for catalog today.

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1122 N. PITCHER ST., KALAMAZOO, MICH.

He Breeds Mink Coats

[*Continued from page* 67]

"You're nuts," snapped Hy.

Then he stuck his head out of the window to see what was going on. Sure enough, it was. The hurricane had lifted cages from the ground and was whirling mink through the air with the greatest of ease.

Hy shut his eyes at this ugly, devastating scene. He had visions of being wiped out.

When the storm had passed, he ran out of the house and released Smokie from her kennel. Then in a hoarse voice he shouted the familiar signal, "Mink out!" That was Smokie's cue to go to work. Like a bloodhound tracking down convicts, Smokie tracked down most of the orphans of the storm. But it took time. Hy thanked his lucky stars that Smokie was around for without her he might have lost hundreds of valuable breeders. As it was, he lost only about 50 animals.

Hy's interest in mink started 15 years ago. A New York fur dealer, he decided to take a crack at breeding mink and thereby get in on the ground floor, so to speak, in a comparatively new industry.

He bought 50 breeders from a Midwestern rancher and housed the animals in the cellar of his country home in Spring Valley. Soon, the obnoxious musk smell which is similar to skunk but not as heavy nor as clinging, almost drove the Pesner family out of their home.

"Either you get those stinkers out of here," flared Mrs. Pesner, "or else I'll leave."

Hy talked his wife into letting him keep the mink until he could solve their housing problem. Meanwhile, mink were dying. Hy didn't know what to do. Undaunted, he bought more breeders and tried again. The longer he remained in the new-fangled business, the more his problems increased.

After a few years of hard luck, Hy successfully pelted 100 kits. The skins were turned inside out and stretched on pelting boards and then hung in the cellar to dry. The next day when Hy went to collect them for the fur market, much to his horror he discovered they were gone. He turned the cellar upside down for clues. None were to be found.

That afternoon, while making the rounds during feeding time, Hy spotted a piece of a fur tail sticking up out of the ground. Digging around it with the heel of his boot, he uncovered a missing pelt. Looking further, he saw pieces of fur protruding all over the place. After much digging he recovered most of the missing pelts.

When Hy returned to the ranch after disposing of the pelts in New York, he lost no

[*Continued on page* 170]

REMODEL IT YOURSELF ... USE THE BEST

PUT YOUR FOOT DOWN ... INSIST ON GOLD SEAL® LINOLEUM TILE!

Put down Gold Seal Linoleum Tile and know that you've got the *right* tile over your wood floor. For this is *genuine* inlaid linoleum . . . *flexible* . . . designed to take the up-and-down movement of the average wood floor without a strain. It *can't* snap, chip, or shatter!

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Only one genuine Congowall that's so tough and sturdy . . . yet so flexible and *downright simple* to put up. Just paste it to the wall . . . that's all! Congowall's special, patented backing *locks* it to your wall . . . *keeps it there*, smooth and tight for good!

Only Gold Seal Congowall gives you a choice of 16 true tile colors, plus the new Ivy and Vine patterns. Cost? Only about 15¢ a square foot . . . including the Gold Seal *guarantee* of complete satisfaction or your money back!

FREE! Special do-it-yourself decorating booklet . . . 16 pages of full-color pictures, ideas, suggestions . . . easy-does-it hints for all rooms. Instruction booklet, too!

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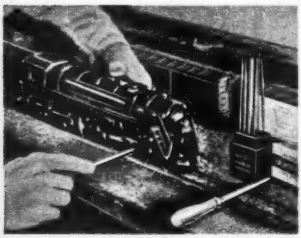
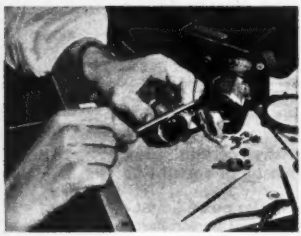
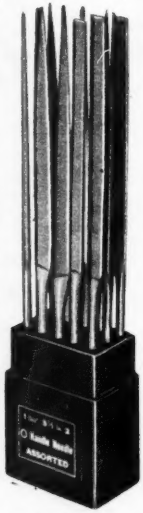
GIVE THIS KIT OF SUPERB NEEDLE FILES







Here's an ideal and most practical gift for amateur or professional craftsman—or perhaps for yourself. Indispensable for those final touches that bring triumph to a delicate fit or successful operation to a critical moving part. Accurately made of high-quality steel, Nicholson X.F. (*Extra-Fine*) Swiss Pattern Needle Files come in twelve assorted shapes; in popular lengths and a choice of cuts . . . all in a handsome blue-and-orange plastic case with bottom stand. *Sold by good hardware stores.*

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NICHOLSON FILES FOR EVERY PURPOSE

He Breeds Mink Coats

[*Continued from page* 168]

time in getting rid of his pet Great Dane. That was the culprit in the plot of the missing pelts!

The mink is a voracious eater. Born in litters of three or four about April or May—they're sometimes no bigger than an inch long—the animals mature so fast that by the time December of the same year rolls around, the kits are ready for pelting. They are killed by hand so the fur won't be damaged. Then they are skinned and the skins are salted and put on pelting boards to dry. Next they go to market, where they are sold in matched bundles of enough pelts to make a stole, cape or coat. It takes 70 to 80 skins to make a fur coat which sells for $2,000 to $5,000.

According to the National Board of Fur Farm Organizations, the average cost of producing a pelt is $19. Broken down, $14 of this goes for feed and $5 for labor. A ranch pelt sells for about $25 leaving the ranch a profit of $6. This isn't much considering the amount of work and risk involved.

Long ago, Hy realized this unhealthy situation and began to think in terms of bigger net profits. He came up with two ideas. First, if a number of ranchers banded together and raised one strain, the matched pelts would therefore be in greater demand.

Second, Hy felt the need for an organization of ranchers to exchange ideas and to buy feed on a cooperative basis.

A couple of years ago, Hy began to put his theories into practice. He convinced struggling ranchers in his area to kill off their strain and replace it with the Ramapo breed, a strain Hy developed. As a result, ranchers began to realize more and better sales with their pelts.

Today, Hy supplies stock and food to the 14 member ranchers, some located as far away as western Pennsylvania and Great Barrington, Mass. The food for the Ramapo Ranch and for animals owned by members of the association, which claims the largest herd of dark mink in the United States, is prepared in a central kitchen at Hy's ranch and sent out by truck twice a week. It is a highly concentrated formula of meat, fish, vegetables and vitamins.

Hy dishes out enough food to feed 25,000 animals a year in spite of the fact that each animal consumes a half-pound a day. The feed, which is also sold to non-members, sells for five cents a pound. Hy claims that this price is cheaper than the feed sold by any other co-op in the country. Mink ranchers using this low-cost feed realize a net profit of $10 per pelt instead of the $6 earned by breeders who pay high prices for feed. •

"Company pays $1200 for cost-cutting idea!" "Employee wins $350 for suggestion!" Ever wonder how *you* can cash in on *your* company's suggestion system? Check these Bostitch case histories. There may be an idea here for *you* — and *your* company.

BUSINESS: Cabinetmaker

SUGGESTION: Fasten bottoms and sides of small chests with Bostitch foot-powered stapling machine and ⅜" staples.

RESULTS: Five times faster than old method of nailing. Stapling more secure. Workers like it better.

BUSINESS: Gasoline Pump Manufacturer

SUGGESTION: Instead of solder, use ⅜" staples to fasten No. 8 mesh on foot valve bottom of pump.

RESULTS: Production jumped from 20 an hour by soldering to 90 an hour with Bostitch.

BUSINESS: Tile Contractor

SUGGESTION: Instead of nailing metal lath to wood studs and joists, use Bostitch hammers and tackers.

RESULTS: One man can now lath 4 bathrooms in 2½ hours compared to 5 hours the old way.

BUSINESS: Garage Door Manufacturer

SUGGESTION: Metal stitch aluminum panels together with Bostitch wire stitcher. Old method: drill and screw.

RESULTS: Plant turns out 500 doors a day as against 50 before. Stitcher and special table jigs for positioning panels save space, material.

BUSINESS: Vacuum Cleaner Manufacturer

SUGGESTION: To fasten metal discs inside fiber cylinders, use Bostitch metal stitcher instead of punching holes and riveting.

RESULTS: Manufacturer saved $6250 the first year.

BUSINESS: Frozen Food Locker

SUGGESTION: Replace cellophane tape with Bostitch desk-type stapler for fastening ends of frozen food packages.

RESULTS: Labor and material costs cut 50%. Bostitch method gives tight, permanent seal. Unlike tape, will not loosen at low temperatures.

TO HELP YOU find ways to apply Bostitch savings to *your* business, send for the 16-page illustrated booklet, "Time and Money-Saving Case Histories." It's *free*—and full of cost-cutting ideas!

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No. 150 SpeedSander
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The Sander with Accessories including: deep contour pad, finishing plate, felts for free abrasives and wet rubbing, lamb's wool bonnet, 90 sheet abrasive covers, etc. in fitted steel carrying case. **$49.50**

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¼ H.P. Universal Motor, cast aluminum housing, safety shut-off switch. Cuts all angles to 45°, any depth to 1⅛". **$29.95**

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Extra power, high speed, electric drill with cast aluminum cases, and geared chucks.

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½" SpeedDrill $39.50
also other sizes, types.

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Several fast selling kits. Painters and Householders Kit (illustrated) is typical. It has: ¼" Hornet Drill, Abrasive Discs and rubber backer plate, grinding wheel, wire brush, buff, etc. In attractive display carton. **$19.95**

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750,000 Platter Chasers

[*Continued from page* 75]

collectors say that as many as one in every 5,000 old records is actually a rare item which can command a good price. If you get your hands on a Mary Garden recording of the Card Scene from the opera *Carmen*, for instance, you'll probably get $50 for it. Or if you had an Elena Gerhardt disc, once made under the Hugo Wolff Society label, you could get $200. Lay your hands on a *Don Giovanni* aria made by one of England's most famous opera stars, Sir Joseph Stanley, and you can expect a bid of $400.

Some of the rarest records today are those made by Caruso back in 1902, before he came to America, especially his arias from Aida.

Also, the record made by the famous Italian tenor, Battistini, who put his voice on discs made in Warsaw, Poland, because he was afraid of getting seasick on a voyage to America.

Probably the most valuable record ever made would bring a small fortune if it could be found. It is supposed to be the only recording made by the renowned Jenny Lind. Nobody has been able to run it down so far. It is the center of the hottest controversy among music authorities since some say she never even made it.

Most collectors admit that there is no standard formula for detecting valuable records. That's why many buy their records by the hundreds and thousands at a time. From these, they select the ones they want to keep, then trade or sell the rest.

But don't think every time you buy a truck load of old records you're going to find some worth a fortune. You can never rely on a single record to bring a fat price. Those who make money out of record collecting insist that it can be done only by buying or trading in volume and selling systematically.

Of course, music—jazz or classical—is not the only thing around which you can build a record collection. Many collectors today are hunting down all the recorded wartime speeches they can lay their hands on, in the hope that these someday will be in great demand. Many collectors look for famous-voice discs only. Others are stocking up on unusual performances. Some aren't touching anything but records of certain sound effects, such as laughing, baby wailing, snoring and sneezing.

How do you get started as a record collector?

According to lawyer Jacob Schneider, now recognized as one of the world's leading private collectors, the best way is simply to

[*Continued on page* 174]

TWO GREAT NEW EXCLUSIVE FEATURES

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WHERE YOU
SEE THIS EMBLEM BOWES SEAL FAST

BOWES "SEAL FAST" CORP., INDIANAPOLIS 7, INDIANA

750,000 Platter Chasers

[*Continued from page* 172]

make up your mind what kind of recordings you're interested in and start collecting them. But don't spend too much money, Schneider warns. You can get a good start by trading with other collectors.

Schneider advertises in such publications as *Billboard, Downbeat, The Record Changer* and the *Saturday Review of Literature*. But he has a word of caution: "No matter how rare a record is, it's not good to anyone unless it's in good condition."

Here are his tips:

1. Keep your records in good shape. Clean them regularly, stack them properly (experts disagree on whether they should be stacked or stored upright), and know just where you can put your fingers on any record by keeping a good catalog system.
2. Maintain a good reputation. If you trade with other collectors, don't send them damaged records. And if they're not satisfied, always assure them of your willingness to return their money or different records.
3. Get special mailing cartons, if you're going to go in for selling or trading, and ship by railway express. It costs more but it's safer and cheaper in the long run.
4. Hold on to records that seem like a waste of space to store. Don't lose patience. Musicians frequently look for their own old recordings and this in itself can become a thriving business.
5. Get to know how a demand for records might come up. Half the fun in this hobby, says Schneider, is being able to predict these demands, almost the way an economist tries to predict periods of inflation and depression.

Even if your collection never gets as big or as valuable as Schneider's, you can be sure that owning an interesting record collection will bring hours of relaxation for many years. But, one word of warning: once you get the collecting bug, you've got to be on guard against going to extremes. Several months ago, a disc fan in the Bronx ran into trouble with his wife with whom he shared a 3-room apartment. When his collection began to expand, he started storing records in closets, then the kitchen. They spilled over into the bathroom and finally into the bathtub. At last, his wife yelled quits and sued for divorce.

His reaction? "I'm glad. Now I've got room for more records." •

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You'll Want to Get Your Hands On This

Power Packed Beauty

Here is a new kind of car, designed to meet the needs of active, on-the-go Americans more completely, more thoroughly, than ever before!

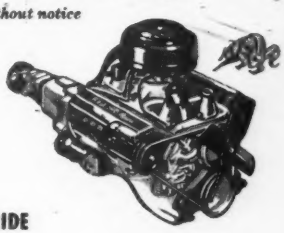
It's powered for action, with a thrilling reserve of acceleration that lets you drive with greater confidence and safety. *It's styled for action*, with lower, livelier, lovelier lines and spacious Travel-Lounge interiors. *It's engineered for action*, with a new road-hugging ride, new steering ease, new Gyro-Torque Drive for nimble change of pace.

You'll want to see and drive America's Thrilling Action Car . . . The new '53 Dodge.

Specifications and Equipment subject to change without notice

Sensational New

140 Horsepower RED RAM V-8 ENGINE!



Packs more power punch per cubic inch displacement. Delivers full 140-h.p. on "regular" gas. New high-efficiency design means *more* fuel energy goes into power, less is wasted on heat and friction.

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Predict Your Own Future

[*Continued from page* 166]

14. a new beau or girl friend is on the horizon
15. trouble lies ahead
16. a trip is in sight
17. water is in view
18. great success is on the way

One soothsayer predicted that Mrs. Eleanor Roosevelt would make her Hollywood debut in 1945 and that Franco would be assassinated that year.

On the other hand, a fortune teller predicted the death of King George VI to the exact day and foretold the passing of William Randoph Hearst 16 months before, missing by only 36 hours.

Yes, every now and then, the mystic fortune tellers come up with a prediction which makes even science wonder. Recently, one told a wealthy importer in San Francisco that he would meet with a fatal accident on his next birthday unless he remained indoors. His birthday fell on a March 17, so all that day he cowered in his home. Nothing happened.

Exactly one month later, on April 17, a truck suddenly careened out of control and smashed into his automobile. He was killed instantly. Searching through his effects, his attorney found a strange thing. Although the man had always celebrated his birthday on March 17, his birth certificate gave a different date. The actual birthday was—April 17! •

Toys For Peace

[*Continued from page* 77]

That started the brothers thinking. They disliked toy weapons and toys that encourage belligerent childish attitudes. Why wouldn't there be a market for toys that encourage constructive attitudes in children? They turned to construction equipment—the kind that contractors use in building roads, dams, airports and bridges. Wouldn't kids like to have models of this equipment that actually worked? The answer has been a resounding "Yes." In 1950 the brothers manufactured 273,000 model toys with an average retail price of $12. These toys included a road grader, bucket loader, clam shell crane, bottom dump truck and an aerial-ladder fire truck.

Into the toys in 1950 went 2,500,000 pounds of steel, plus aluminum, brass, wire, thread and paint. Over a million tires were produced for the brothers by Goodyear and Firestone as exact replicas of their own products. And each toy is authorized by the manufacturer down to the miniature decals. •

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THIN METAL! PLASTIC!
QUIET OPERATING!
PORTABLE!

No. 201

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MOTOR INCLUDED

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Motor Included

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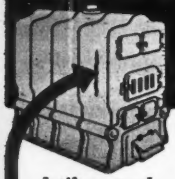
Save Fuel Costs



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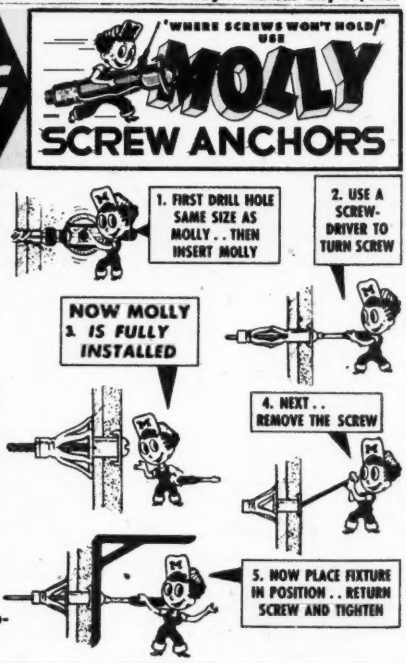


MOLLY CORP. DEPT. 1178 READING, PA.

Italy's Masterpieces

[*Continued from page* 89]

Mercury-powered chassis of truly weird design, complete to De Dion rear end made in Detroit! This job, with a center pole frame and dual exhaust, was so low you'd have to look up at a snake. Who knows? It could be the first of a new Lincoln Continental.

Not all the famous factories are within the city limits of Turin. For example, at nearby Modena is the Ferrari plant. Osca and Maserati works are at Bologna, just another hop and a jump away. But for all practical purposes, Turin is the focal point and the place from which they all get their manufacturing supplies. The huge Fiat plant nearly matches in size our biggest factories in Detroit and is jammed with American machines and presses turning out cars like hot dogs at Nedick's. The Lancia plant, about the size of our own Packard works, turns out 49 cars a day but here's the catch on why, with such a huge establishment, it doesn't boast a higher output. Practically every component of Lancia's famous cars, with the exception of the tires, are made on the spot. Gigantic American stamping machines, worth hundreds of thousands of dollars, turn out bodies, doors, frames and all similar work. Pistons, engine blocks, cams, crankshafts, rear axle assemblies are also made under Lancia's roof, mostly using E.C.A. gift equipment. Because of the nearly complete operation, final production is slow.

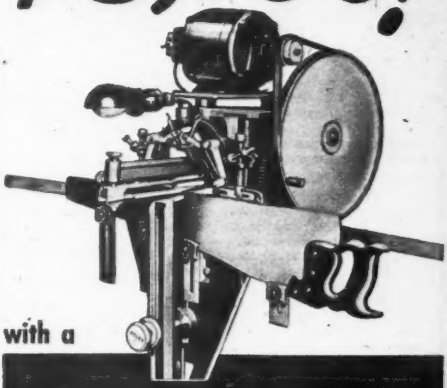
The real meat of the Italian automotive school, and the reason why our Detroit boys spend so much time visiting there, are the smaller custom design and body shops such as those of Pinin Farina and Ghia and the Fiat experimental shop known as Siata. At the Siata plant all experimental work for the huge mother organization takes place. This is where everything from the Siata Spider and the V-8 Fiat-engined Siata to the good looking Chrysler-powered chassis is worked out and where the sleek Cisitalia is made. Twelve hours a day, the tortured din from the engines in the dynamometer room shakes the small plant. I was lucky to have Alfred Momo, of Momo Engineering in Long Island City, with me on all these calls. Alfred, before settling in America as this country's greatest authority on continental cars, was one of Fiat's top men. He was born and raised in Turin, knows intimately every Italian engineer and company head and is related to many of the big-wigs. He got me into a lot of spots that otherwise would have been barred to me, or to anyone else not connected with the company.

The amount of American experimental work being done for Detroit was tremendous,

[*Continued on page* 181]

Last Year's Profit

$3,000!



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Italy's Masterpieces

[*Continued from page* 179]

especially in sports-type cars. But as I was sworn to keep some of the things I saw, and who they were for, off the record, all I can say is "Sorry I can't tell you more." I will say hallelujah if some of our balloon-builders have the guts to borrow enough from the Italians to follow through and produce some real automobiles with safety features designed and built right in, instead of the mass-murderers Detroit is getting away with.

What do the Italians really have that we haven't and how do they rate? What they have can be rolled into a ball pretty quick. Style, sometimes at the expense of comfort, and superbly fashioned bodies. The Italian school of automobile design is similar to the design hold Paris had on the dress business for so many years. Italian cars, for the most part, are chic in an adventurous sort of way. Instead of making your thoughts wander to hot dog stands, crowded suburbs and billboards advertising liver pills—as Detroit cars are apt to—most Italian designs sweep your thoughts to the Grande Corniche drive above Monte Carlo with a deep-throated, foreign-accented babe who really is stacked. It runs with dreams of breaking the bank at the Casino, to long weekends on the North African coast, to just hearing the boys exclaim "Wow! Look at that car!" when you pull up at Herman's Hash House in Peoria. Okay, I'll say it, much as I hate to—these Italian cars have glamour, a product unknown in Detroit since the days of Billy Sunday. The reason isn't too hard to understand if you know most of the top Detroit brass as I do. Most of them have as much glamour in their souls as an old rubber boot. Aside from the looks angle, most of the good Italian cars have excellent flat cornering, safe suspension and real brakes.

How about reliability, price and power plants? Italian cars in general are much too expensive for what you get. And this overpriced policy seems to square as the quality goes up. For example, take the Ferrari. Until recently this car built by Enzo Ferrari was considered the undisputed pearl of all sports car automobility. The cheaper models cost a little over ten thousand clams on these shores for a two-seater bucket about as roomy as an MG. From there, prices went to $15,000 for the larger two seater 4.1—litre roadster or coupe and so were definitely built for guys who didn't mind being taken, providing they got what they wanted.

Ferrari has had an enviable post-war competition record but perhaps there was a reason for this. John Fitch, America's sports car driv-

[*Continued on page* 183]

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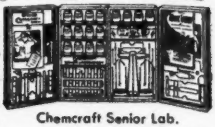

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Italy's Masterpieces

[*Continued from page* 181]

ing champion of 1951 and a man who has won important races at the wheel of a Ferrari, said to me in Turin one night, "Tom, I think the Ferrari is a pretty over-rated car." He then went on to point out that a good part of Ferrari's success was undoubtedly due to the fact that he was the first post-war builder of serious competition models. Mercedes only got in production in time to run away with this year's Le Mans race. The great Alfa and Maserati teams of the past just didn't get going and this left the whole bottle of cream open for the Ferraris for several years.

I think the Cunningham, with a price tag of many thousands less than a 4.1 Ferrari, will win the buyer in America more races and the Allard, selling for nearly $12,000 less, is a much better buy for American competition. The Lancia Aurelia, on the other hand, is a small two-door, general purpose coupe with a V-6 two-litre engine that has really demonstrated its ability in big-time competition. This little car finished sixth at Le Mans in the overall and walked away with its class honors. Two weeks later it creamed all the competition at the car-killing Targa Floria in Sicily by coming in one, two and three. Even this job, with its about $6,000 price tag in the U. S., seems too high when compared with a Porsche, for example. The Osca, with a production program that is almost non-existent, is a real mouth-watering can. The small 1½-litre job that went so well for hours at Le Mans before stopping, had a Vignale body that was right out of a Space Cadet script.

The Italians are, at this writing, the undisputed style leaders and body builders of the industry. It looks as though this particular crown is safe for years to come. As overall cars, however, the Mercedes-Benz, French Gordini, Porsche, Cunningham and a few others may soon oust them from sports and Grand Prix car leadership. In more general utility cars the Italians build nothing today that on a dollar-for-dollar basis can top a Jaguar Mark VII. In the real luxury class they never have built a car that could even qualify to carry the spare tire for the new 120-mile-per-hour Silent Bentley Sports Sedan that has all the room of a Cadillac, will last a lifetime and can be used going to the corner for a hamburger or to the opening of the Metropolitan Opera. I did better than 122 miles per hour in one of these during the Le Mans race while it was being used as the official pilot car. That Bentley chassis and a good custom Italian body would be a combination that would have the Detroit boys drooling for the next 25 years—and me, too. •

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Sight For Your Rifle

[*Continued from page* 92]

transfer from 2¼ to 5 power by the simple twist of a knurled knob and do not change the "zero" of the sight in the process. For those who like to use their big game rifle for varmint shooting, these variable power scopes are a definite asset.

For general hunting, few experienced hunters will argue against the theory that the scope should not exceed 2½ power. Increasing the magnification not only reduces the field of vision, but exaggerates the "wobble."

Although the majority of the western shooting is done at greater distances than in the east, a 2½-power scope is usually adequate although doubling this power often results in a kill that otherwise would be difficult. The variable power scope has a greater value then, and for varmint shooting the real enthusiast usually turns to an eight or ten power scope, and some of the really long-range shooters insist that the 20-power target scope provides the best results.

The reticule preferred is an individual matter. Most manufacturers offer a choice including coarse or fine cross hairs, a cross hair with a post or picket, cross hairs with a "Lee" dot (a transparent "dot" at the intersection of the hairs) or even a post or picket without cross hairs. For all-around hunting, the coarse hair is generally preferred although some varmint and target shooters prefer the fine.

Where iron sights are concerned, the peep is the only practical solution and it pays to spend a bit more and have a sight with a micrometer adjustment and quarter-minute clicks. Most of the better iron sights and all good target sights are equipped with quarter-minute clicks to simplify sight adjustment. One minute of elevation on a sight changes the point of impact of the bullet one inch at 100 yards, and as the indicator on the visible scale would show only an unfinitesimal change through the movement of one minute, the audible clicks are important. Four clicks indicate a change of one minute and by having the rifle sighted in at a definite range and knowing how many clicks are required to raise the point of impact at greater known ranges, the shooter is certain of obtaining the greatest possible accuracy from his rifle.

The type of aperture and the size of the aperture depend upon the shooting to be done. The target shooter will insist upon a large disc with a small aperture and may want a front sight with a hooded ramp and any one of a half-dozen assorted inserts. The hunter, on the other hand, will not want to be encumbered with a large disc which may catch on brush or be in the way. •

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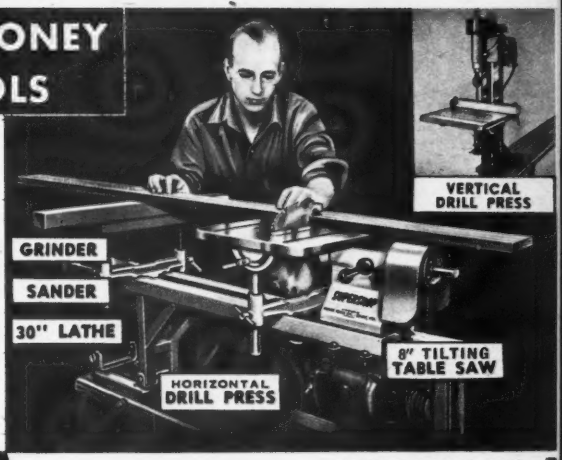

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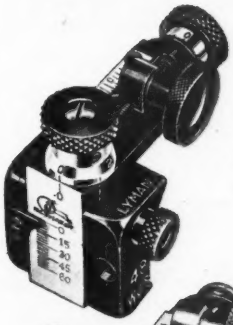

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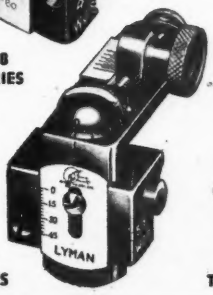

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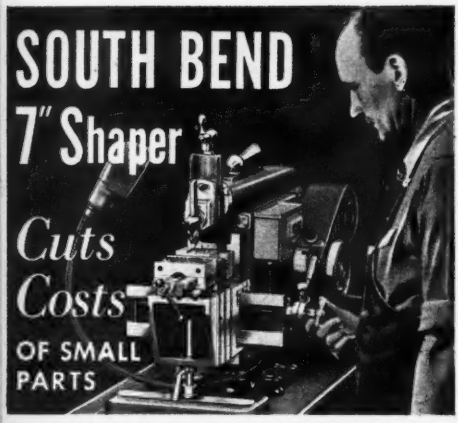

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Telescope Maker's Page

[*Continued from page* 153]

To keep stray light from fogging the film wrap a black cloth around the camera and the telescope at the point of junction. Set the rear shutter of the camera on time and move the camera back and forth until the image at which the telescope is pointed is as sharp as possible on the ground glass. If your camera has no rear shutter, make the exposure by capping and uncapping the telescope tube.

Remove the ground glass and insert the film pack adapter or cut film holder. Use a high speed film such as Super XX or Superpan Press. Inasmuch as telescope lenses are not calibrated in "f" stops you will have to determine the value this way: divide the diameter of the telescope lens into its focal length. This particular telescope had an objective with a 20 in. focal length; its diameter was three inches. Dividing 3 into 20 gives us roughly 7 or photographically speaking f-7. The exposure was made at 1/50th of a second. Photographs taken of the moon are particularly rewarding. An exposure of 1/25th at f-4.5 will yield an acceptable image. Best results are obtained when the moon is at "quarter" or "half." An ordinary camera can be used provided it has a lens of fairly long focal length. •

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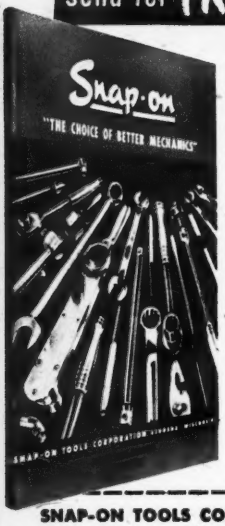

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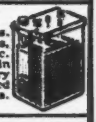

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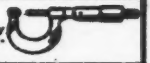

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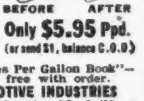

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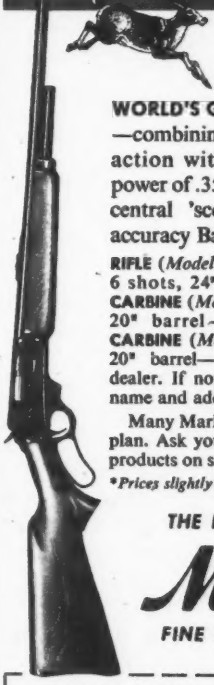

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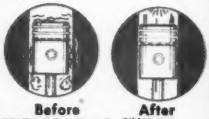

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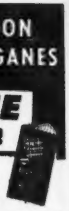

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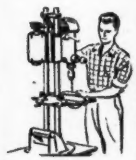

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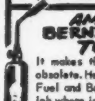

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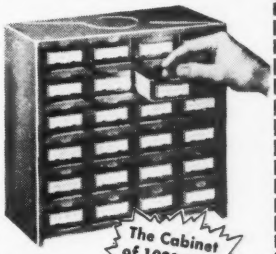

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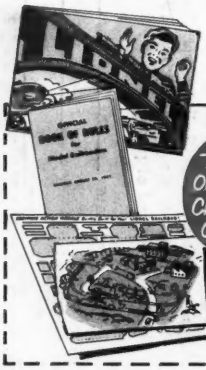

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